DECEMBER 9, 1961

Chemical Week

A McGRAW-HILL PUBLICATION PRICE FIFTY CENTS

Dividends stay up despite leveling off of industry's profits p.25

Inventory survey finds companies still reluctant to build stock levels p.39

Catalyst cleaning by ion exchange bids for refinery jobs p.93

Sizing up the West. Market probers take bright view of area's prospects p.105

'CPI IN POLITICS' FINDS A PRETTY PROPONENT . . . p.31

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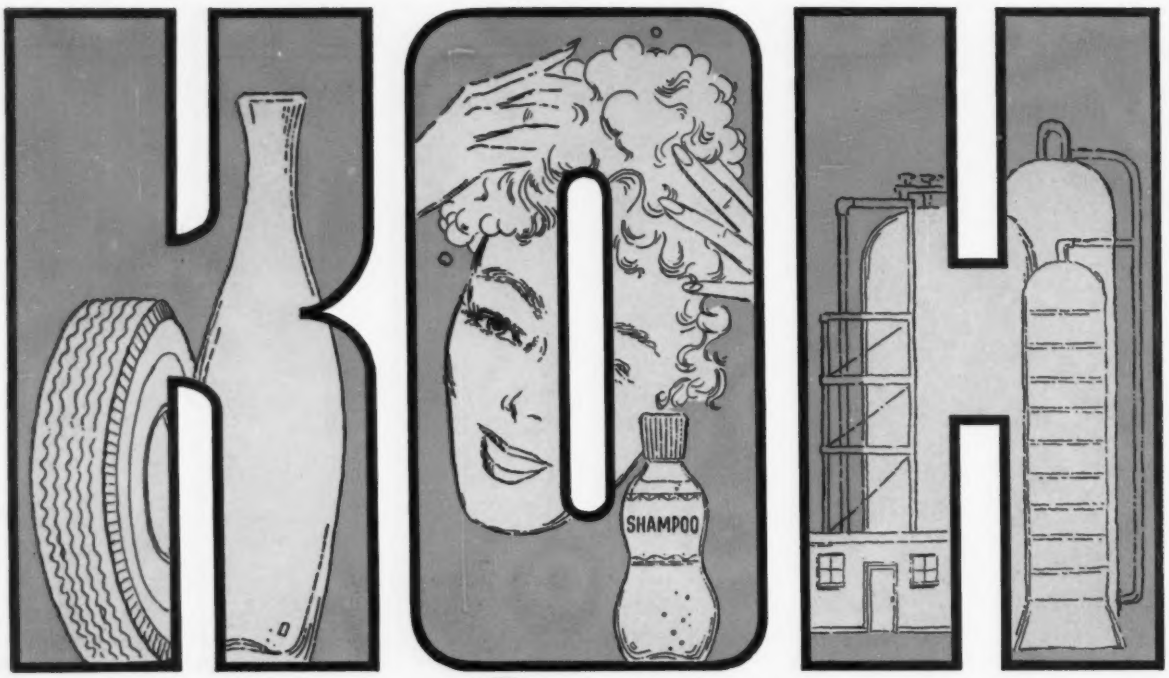
Alkali users who depend on



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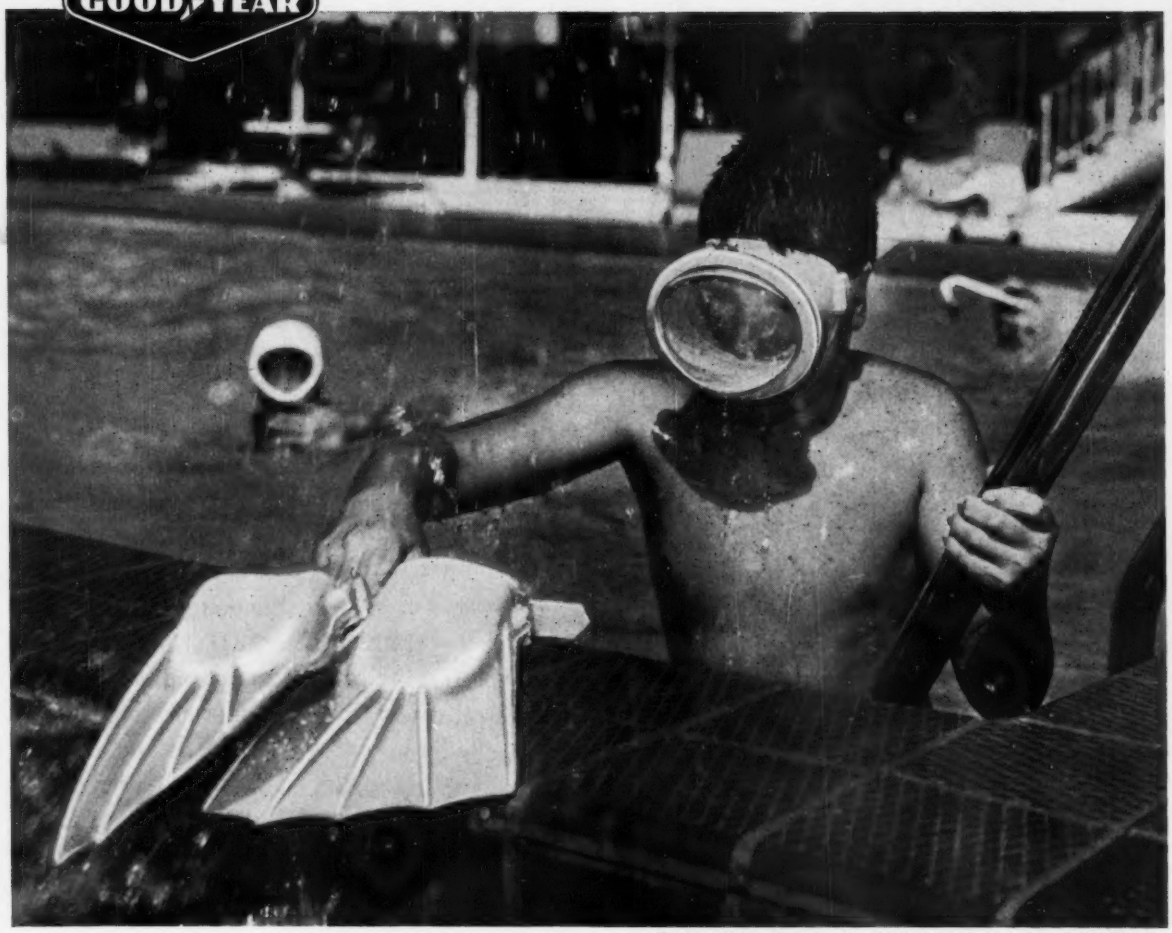

Photograph taken with cooperation of Globe Rubber Products Corp., Philadelphia, Pa.

Underwater or over the counter– PLIOFLEX Rubber thrives on competition!

The market for swimming accessories made from rubber is big–but so is the competition. The manufacturer that meets the challenge over the counter keeps plant costs and overhead in fighting trim.

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CHEMICAL DIVISION

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Chemical Division

The American Agricultural Chemical Company

100 Church Street
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40 plants and offices

ON THE COVER: Sarah Schoenkopf, Democratic committeewoman from New York City, tells American Cyanamid Group why regular political organizations welcome interest (p. 31).

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Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Telephone, LO 4-3000; Teletype, TWX N. Y. 1-1636; Cable, McGRAWHILL, N. Y. Place of publication: Philadelphia, Pa. Second class postage paid at Philadelphia. (See below for directions regarding subscriptions or change of address.) OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, president; Shelton Fisher, Wallace F. Traendly, senior vice-presidents; John R. Callaham, vice-president and editorial director; Joseph H. Allen, vice-president and director of advertising sales; A. R. Venezian vice-president and circulation coordinator; Daniel F. Crowley, vice-president and controller. OFFICERS OF THE CORPORATION: Donald C. McGraw, president; Hugh J. Kelly, Harry L. Waddell, executive vice-presidents; L. Keith Goodrich, executive vice-president and treasurer; John J. Cooke, vice-president and secretary.

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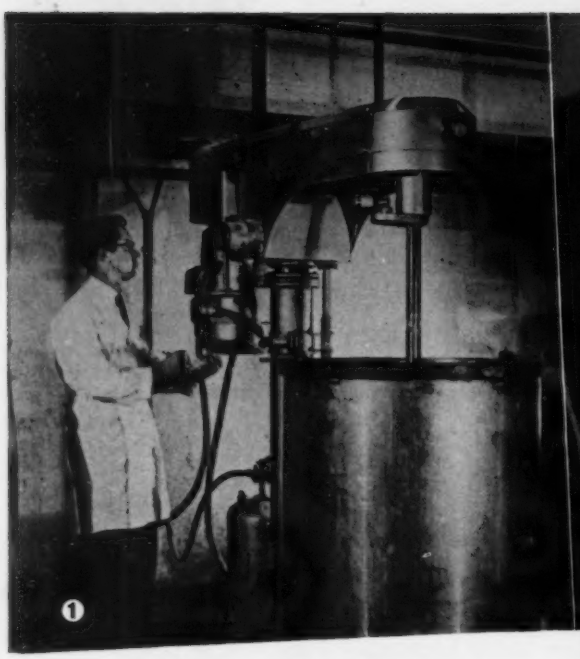

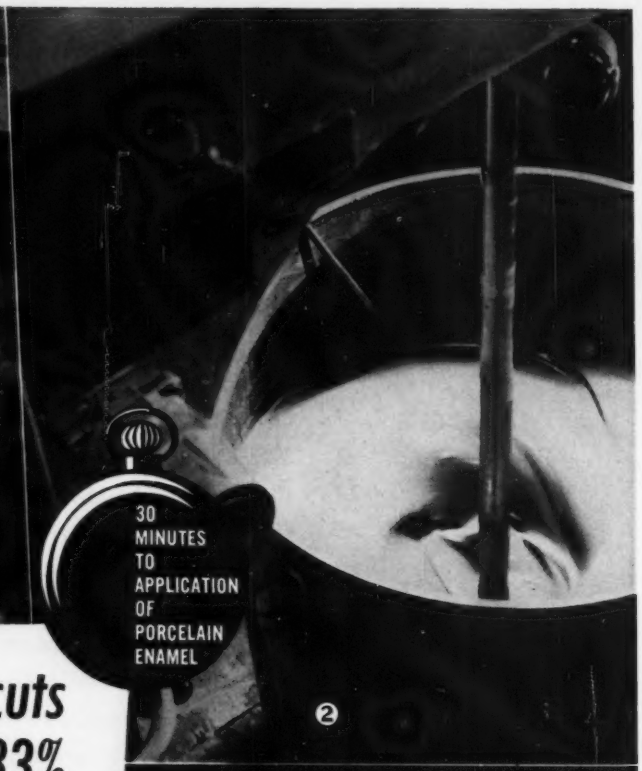

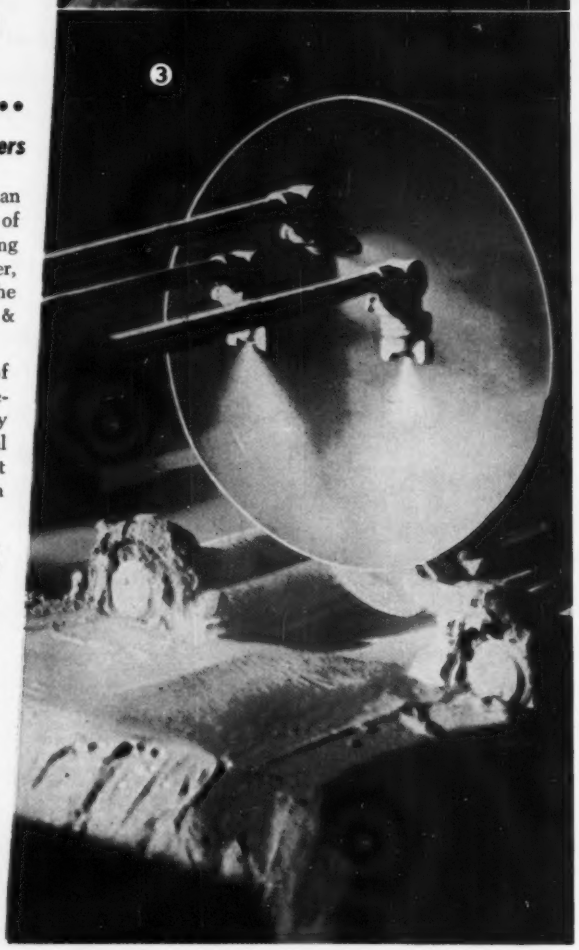

"COWLES DISSOLVER" cuts slip preparation time 83% for Day & Night Mfg. Co....

in producing lining material for famous Jetglas Water Heaters

① "We can now prepare 100 gallons of slip in no more time than it took us to charge a ball mill with the equivalent amount of material, thereby eliminating the time formerly required for milling and testing," says Douglas W. McCallum, Senior Corrosion Engineer, Ceramics Research & Development, who is shown here with the "COWLES DISSOLVER" Model 520-VHV in use at the Day & Night plant.

② This "COWLES DISSOLVER" produces 400 gallons of precisely blended slip in 2 hours, 100 gallons per batch, using premilled frit. Milling time for a 400 gallon batch by the previously used ball mill method was 12 hours. This is an 83% saving in actual milling time. Additional advantages experienced at Day & Night through use of the Cowles were in cutting material losses and much time saved on clean-ups.

③ 100 gallons of accurately controlled slip mixture is ready for application in 30 minutes. Day & Night applies slip to interior of Jetglas Water Heater after which it is baked to a high, corrosion resistant glaze. The "COWLES DISSOLVER" provides speed and accuracy in preparation of the material, thus contributing substantially to the efficiency of this highly automated process.

Cowles Dissolvers are applicable to a wide variety of liquid-liquid, solid-liquid and gas-liquid materials, with viscosities up to 50,000 centipoises or more. They produce ultimate dispersion faster, in less space at less cost.

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Effective Selling Costs Money

OUR FEET HURT. We tramped up and down every aisle between the Chemshow exhibits, first on the Coliseum's fourth floor, then the third and second, and finally the first—and it was worth it. There was a wealth of new developments *(see p. 113)*, a healthy interchange of information, and a businesslike approach. Most exhibitors, we're sure, felt that their time and money were profitably invested.

But a sizable minority of the exhibits, it seems to us, were poor investments. Products were unimaginatively displayed, and there was nothing to catch and hold the visitors' attention. Such an exhibitor seemed to believe that he had a better mousetrap—and it was up to the world to beat a path to his door. Or perhaps the word had come down from his board to hold the line on costs and cut out the "frills." Whatever the reason, he lost his investment because he failed to spend the additional sums required to make it yield the maximum return.

In our competitive economy, the world doesn't beat paths. On the contrary, the better-mousetrap makers come to the world—and the successful approach is helpful, informative, truthful and imaginative.

That's how the show was, mostly. And the few who failed in their approach didn't have to walk far down the aisle to learn some good lessons from their competitors.

These observations apply to aspects of selling other than trade shows. Suppliers of chemicals, equipment and services have generally licked their production and financing problems; manpower is plentiful; delivery times are short; research and development proceed apace.

Today's competitive conditions have shifted the spotlight from these areas of corporate activity to marketing, which—let's face it—has been lagging.

Your company's research is continually developing better mousetraps —but so is your competitors' research. And they, like you, have largely licked their production problems. Therefore the best tool for shaping profits is imaginative marketing.

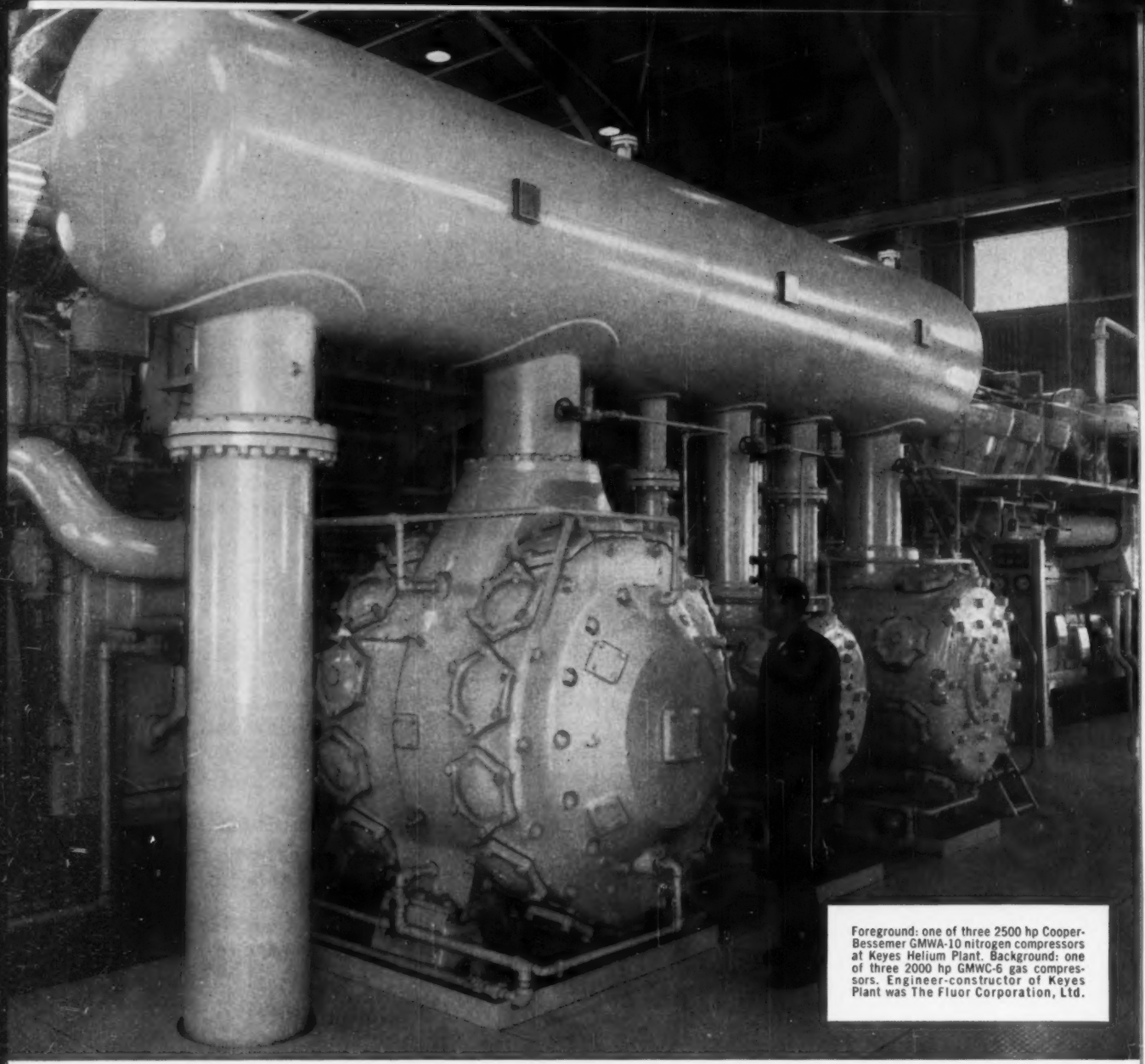
Cashing In on the Headlines

IT TOOK imagination to harness nuclear energy, as it did to conceive of synthetic detergents. Add to these the enterprise shown by this Ohio car washer and you have a telling lesson in American business acumen.

We have no idea how much fallout is contaminating the automobiles of Cleveland—probably very little; and we figure that being knocked down by a car is far likelier than being irradiated by one.

Be that as it may, our hat is off to this entrepreneur who, like the hawker of spyglasses after the Sputnik launching, exploited the headlines for profit.

Cleveland auto laundry fallout gimmick.



Foreground: one of three 2500 hp Cooper-Bessemer GMWA-10 nitrogen compressors at Keyes Helium Plant. Background: one of three 2000 hp GMWC-6 gas compressors. Engineer-constructor of Keyes Plant was The Fluor Corporation, Ltd.

How U.S.A. puts the squeeze on its helium

The job of extracting helium from natural gas is a low-temperature process in which compression plays a key part. And that's where Cooper-Bessemer horsepower comes in . . . in a big way.

At our country's two principal existing helium plants —the Exell Plant near Amarillo, Texas, and the Keyes Plant at Keyes, Oklahoma—Cooper-Bessemer gas engine compressors play key parts in both of the basic, heavy-duty compression operations for helium extraction...compressing nitrogen for refrigeration and boosting pressure of natural gas for return to supply lines.

At Exell, built during World War II and expanded in 1956, ten C-B compressors total 8,800 hp.; at Keyes, completed in 1959, six total 13,500 hp. All of the Cooper-Bessemer units in both plants are giving reliable service, 'round-the-clock in the production of this highly important inert, lightweight gas for industry and the U. S. defense program.

Call our nearest office for information on C-B products for *your* compression and power facilities.

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LETTERS

Lilly and M&R

TO THE EDITOR: Your article concerning McKesson & Robbins (*Oct. 21, p. 37*) makes the following statement: "Industry sources say (though the company denies it) that Eli Lilly may be on the point of dropping its franchise with McKesson & Robbins, setting up its own distribution network." . . . It is clear that the editor chose to doubt the Lilly statement. . . .

[You also say] that "Lilly now sells about $300 million worth of drugs yearly through M&R." . . .To set the record straight, our worldwide sales of all products of the domestic company and of Eli Lilly International and all our subsidiaries totaled only $199.8 million in '57, the best year in our history.

We assume that the same source told your editor that Lilly "began putting pressure on M&R recently by reducing its discount schedule about 3% across the board." The implication is that Lilly singled out McKesson & Robbins for special treatment. . . . The new discount schedules applied to all Lilly wholesalers alike.

The statement that the discount schedule was reduced "about 3% across the board" appears to be an inaccurate interpretation of our new discount structure, which was put into effect July 1 after ample advance notice to wholesalers. There was no flat reduction of discount "across the board." New schedules provided varying discounts on different classes of products in place of the flat discount, which had previously been in effect on most of the Lilly line.

It is our belief that the new discounts, far from hurting wholesalers, will enable them (as well as Lilly) to meet competition more effectively in large-volume markets. Important increases in sales should result.

Finally, it is this company's considered opinion that distribution through the wholesaler continues to serve best the public's health needs and the professional and business interests of pharmacy and medicine. . . .

A. J. W. LEBIEN
Vice-President, Marketing
Eli Lilly and Co.
Indianapolis, Ind.

We did not "choose to doubt" Lilly's statement; but at the same time we felt that it was incumbent upon us to take cognizance of an opinion held by many who are close to the situation. —ED.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 West 42nd St., New York 36, N.Y.

Swisspharma's Parents

TO THE EDITOR: I have read with great interest your article (*Oct. 21*, p. 29). . . concerning Swisspharma . . . The three Swiss founders are Ciba, Sandoz and Wander . . .

ALBERT WETTSTEIN
Scientific and Technical Director
Pharmaceutical Division
Ciba Ltd.
Basel, Switzerland

MEETINGS

Pharmaceutical Manufacturers Assn., Eastern regional meeting, Waldorf-Astoria Hotel, New York City, Dec. 11-13.

Weed Society of America, meeting, Jefferson Hotel, St. Louis, Mo., Dec. 11-14.

Eastern Joint Computer Conference, Sheraton-Park Hotel, Washington, D.C., Dec. 12-14.

Rensselaer Polytechnic Institute, materials research conference, Troy, N.Y., Dec. 18-19.

American Assn. for the Advancement of Science, Denver Hilton Hotel, Denver, Dec. 26-31.

American Society for Quality Control, American Institute of Electrical Engineers, Electronic Industries Assn., national symposium; theme: "Reliability and Quality Control," Statler-Hilton Hotel, Washington, D.C., Jan. 9-11.

American Institute of Mechanical Engineers, annual meeting, Statler Hotel, New York City, Jan. 12-15.

American Institute of Mining, Metallurgical and Petroleum Engineers, fourth mechanical working conference of the Metallurgical Society, Pick-Congress Hotel, Chicago, Jan. 17.

National Plant Maintenance and Engineering Show, Convention Hall, Philadelphia, Jan. 22-25.

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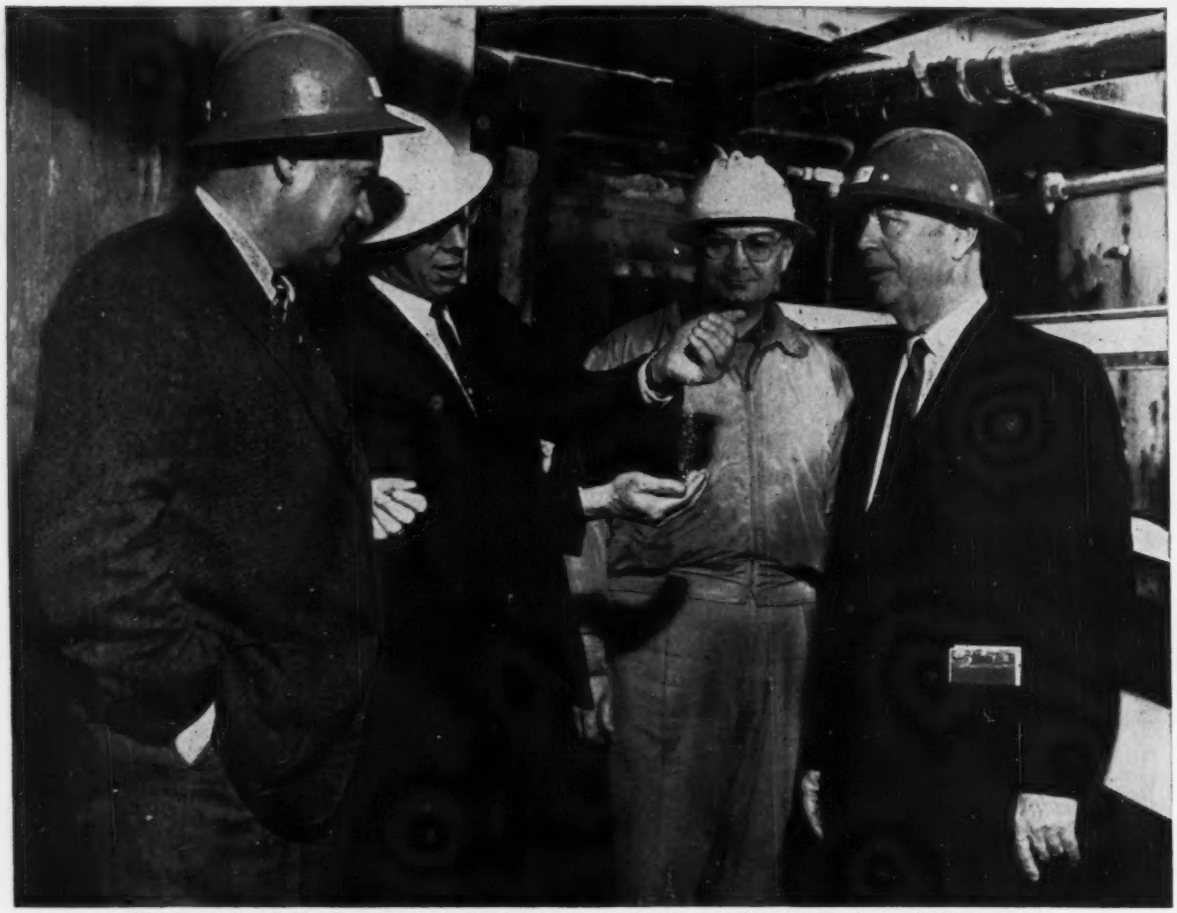
·BEHIND THE MAN FROM DIAMOND CRYSTAL: the prompt, personal service of Whit Lonsdale



Whit Lonsdale, left, Vice President in charge of rock-salt sales for Diamond Crystal, talks about salt with three key men of American Potash & Chemical Corporation (second left to right); George E. Adam, General Manager of the Aberdeen Plant; R. J. Vreeland, Production Superintendent; and Lawrence H. Cornelius, Director of Purchasing.

Every year, Whit Lonsdale travels thousands of miles to follow through on Diamond Crystal service. As Vice President in charge of rock-salt sales, Mr. Lonsdale knows the importance of a uniform, high-purity salt for chemical use. With major chemical companies like American Potash, the uniformity and high purity of Diamond Crystal Salt are important contributions to the overall smoothness of the operation.

Here at its Aberdeen Plant in Mississippi, American Potash manufactures sodium chlorate for use in the pulp, paper and agricultural industries. Salt, electricity and water are the raw materials for this widely used product. Like so many other leaders in the chemical field, American Potash turns to Diamond Crystal—and the personal attention of experts such as Whit Lonsdale—for its salt service.

If a high-quality salt, backed by ready availability, is necessary for *your* operation, call or write—

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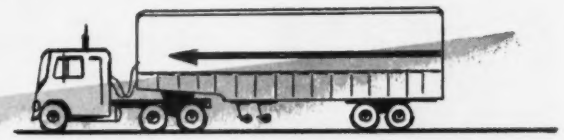

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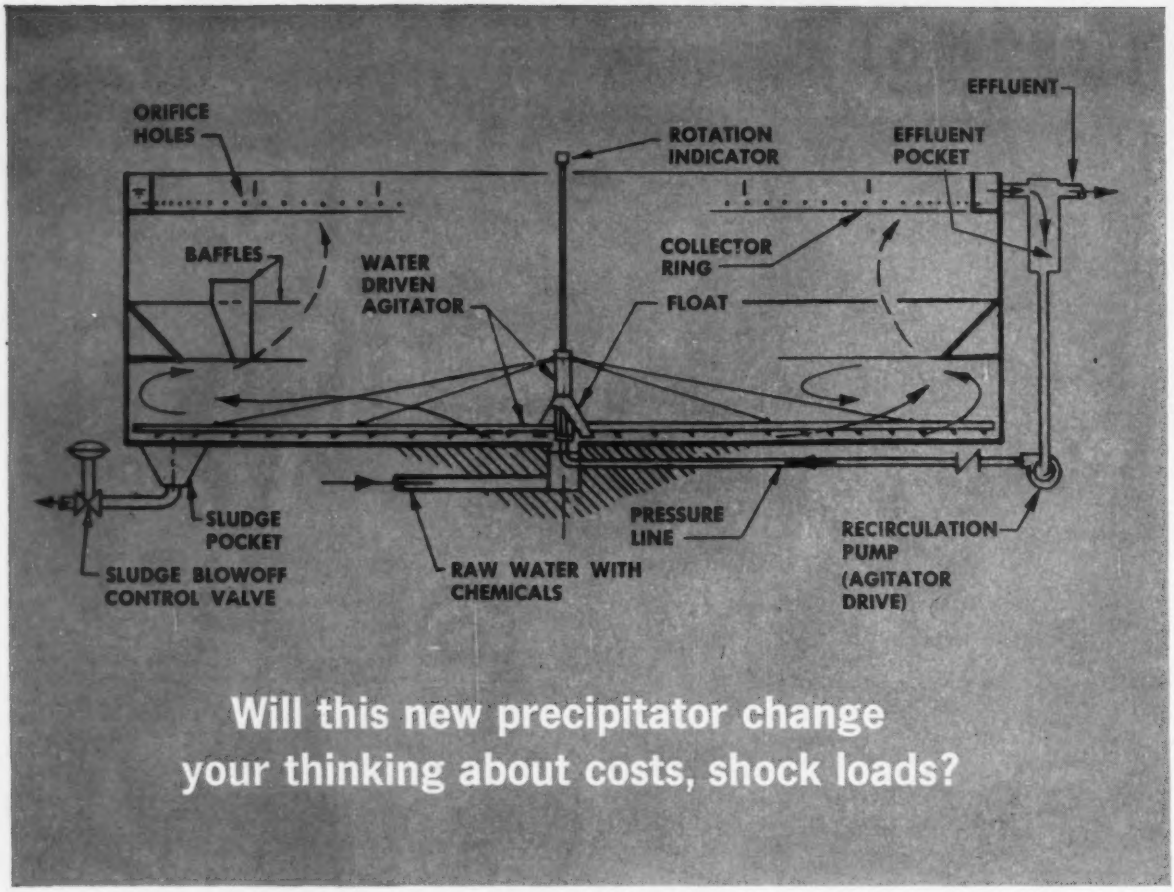


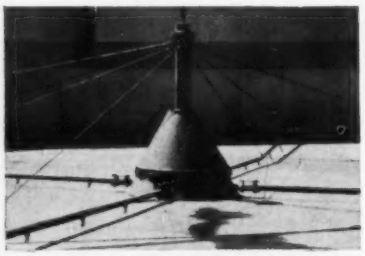
New Permutit Type M Precipitator ... a study in simplicity

Now in operation is this new precipitator for reducing turbidity and color in water.

We call it the Permutit Type M Precipitator. It is a study in simplicity, and because of its low construction and operating costs, it opens up new opportunities to obtain solids-contact clarification at minimum cost.

"Missing" parts: There is no motor-driven agitator on the Permutit Type M Precipitator. No extensive baffling. No center platform. No access walkway. All these have been done away with, because the unit has a new and different agitator system which sweeps away the settled sludge. Rotating agitator arms are supported by a "semi-buoyant" hub (or float) which revolves about a bearing post on the tank floor. Recycled effluent drives the agitator through jet nozzles located at the end of each arm. Smaller jets, spaced along the arms, gently nudge the settled sludge toward a sump at the outer rim of the tank floor.

Briefly, this is how the M unit works: raw water and chemicals are mixed in line and enter at the center of the tank floor beneath the conical rotor float which deflects the fluid mixture radially outward to the walls. A horizontal baffle on the tank wall then reverses the flow back toward the center thus imparting a rolling action to the sludge blanket. This current flow constantly places previously formed sludge in intimate mixture with the raw water immediately as it enters the tank. Clarified, effluent is collected by a flume at the top.


Agitator float and hub assembly.

Sudden water changes: An additional benefit of the Permutit Type M Precipitator is its exceptional ability to handle shock loads.

A case in point: red dye from a paper mill a mile upstream showed up one day in the raw water entering a Permutit Type M Precipitator in use in New England. But the unit went right on putting out an effluent with no significant change in quality.

So much interest has been shown in this new unit that we have reprinted the paper, "A Recent Development in Solids Contact Clarification Design", by E. D. Driscoll of Permutit. We'll be glad to send you a copy.

Write to Permutit Division, Dept. CW-121, 50 West 44th St., New York 36, New York. (In Canada, contact the Permutit Company of Canada, Toronto.)

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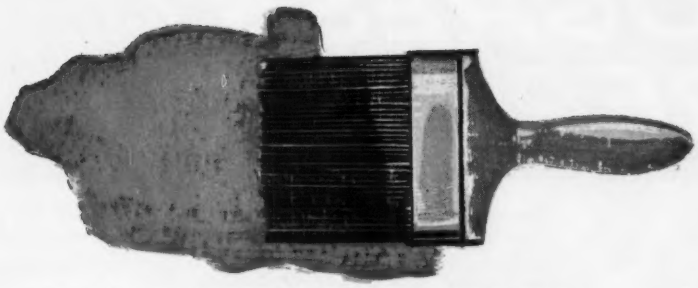

In developing V.M.&P. Solvent 230, Delhi researchers set as their goal the same high standards which have earned Delhi chemicals their reputation for high standards and rigid adherence to specifications.

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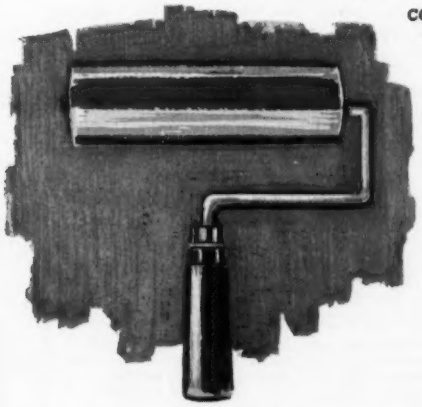
Delhi high quality VM&P Solvent 230 is refined from selected petroleum stocks, for use in paint, varnish, protective coatings, rubber compounding, tape, ink thinning, metal cleaning, hide degreasing, polish formulations and other chemical applications.

VM&P Solvent 230 has a mild pleasing odor, is uniform, features high solvency (KB-40) and high flash point (50°F). Delhi VM&P Solvent 230 is available from our plants and terminals throughout the United States...

COMPLETE SPECIFICATIONS WILL BE FURNISHED UPON REQUEST.



CHEMICAL DIVISION

DELHI-TAYLOR OIL CORPORATION

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CORPUS CHRISTI • CHICAGO • CHARLESTON, S. C. • BATON ROUGE • HOUSTON

PROGRESS REPORT

—TERGITOL 12-P Nonionics
—FLEXOL Plasticizer Z-88
—Glyoxal Special

Dodecylphenol adducts expand TERGITOL series of nonionics

Systems that rely on making water work more efficiently can utilize the properties of four new dodecylphenol adducts in the complete range of nonylphenol surface active agents, trademarked TERGITOL.

Members of the new TERGITOL 12-P nonionic series provide properties for equivalent detergency, but generate considerably less foam than their nonylphenol counterparts.

TERGITOL 12-P NONIONICS

TERGITOL 12-P-6 (dodecylphenol plus 6 mols of ethylene oxide) is soluble in aromatic and aliphatic hydrocarbons and ideally suited for sulfation.

TERGITOL 12-P-9 (dodecylphenol plus 9 mols of ethylene oxide) is an extremely low-foaming surfactant with good detergency properties. It is soluble in aromatic hydrocarbons.

TERGITOL 12-P-12 (dodecylphenol plus 12 mols of ethylene oxide) is a general-purpose nonionic that is completely water-soluble, and is highly effective in either built or unbuilt detergent formulations. Low foam generation suggests its application in controlled sudsing detergents.

TERGITOL 12-P-15 (dodecylphenol plus 15 mols of ethylene oxide) is a highly water-soluble nonionic surfactant. It has been developed for use as a detergent and wetting agent in systems where high temperatures and high concentrations of electrolyte make less soluble products ineffective.

For data on properties and quantities, consult your CARBIDE Technical Representative, or check the coupon below.

FLEXOL Z-88 improves hand of vinyl film, sheeting, and fabric

Although every phase of vinyl plastics production has already been covered by CARBIDE's fast-growing list of plasticizers, another high-quality plasticizer has been added to the line. It is FLEXOL Z-88 (di-2-ethylhexyl azelate).

Due to its high compatibility, FLEXOL Z-88 can be used as the sole primary plasticizer in applications demanding the maximum in low-temperature performance. Its relatively low volatility enables such plastics to maintain their properties over extended periods.

CARBIDE's new plasticizer provides a marked improvement in the drape, softness, and hand of vinyl film, sheeting and, particularly, coated fabrics, where it gives outstanding low-temperature protection. It also offers low water extraction, low soapy-water extraction, and excellent heat and light stability.

The low temperature performance of FLEXOL Z-88 makes it ideal for obtaining the hand, or soft pliability, automobile owners expect of vinyls.

Provides uniform, stable viscosities

In vinyl foams, which involve critical viscosities and require a higher degree of permanence than other vinyls, the uniform and stable viscosities of plastisols made with FLEXOL Z-88 are a definite advantage. FLEXOL Z-88 is added to general-purpose and low-temperature foams to modify viscosities and give good low-temperature results. It also is an excellent material for skin coats for vinyl foams.

For full information on the distinctive properties of FLEXOL Z-88, check and mail the coupon below.

Higher-purity Glyoxal offers new intermediate for many applications

CARBIDE has developed a new process for producing glyoxal of higher purity, with low color, and without traces of either ethylene glycol or formaldehyde. To distinguish the new CARBIDE product from other grades it is identified as Glyoxal Special.

In reconstituted tobacco, Glyoxal Special serves as an insolubilizer for the binder. Its better color extends its use as an insolubilizer for adhesives and as an intermediate for tetra-methylol acetylene diureine and other crease-proofing agents for textiles.

Glyoxal Special's unique two-carbon dialdehyde structure and its reactivity also suggest use as an intermediate for pharmaceuticals, agricultural chemicals, textile and epoxy resins, and in other areas where new chemical structures are continually being synthesized.

For information on properties and delivery of development quantities, call your CARBIDE Technical Representative, or use the coupon below.

FLEXOL and TERGITOL are registered trade-marks of Union Carbide Corporation.

Union Carbide Chemicals Company
Div. of Union Carbide Corporation
270 Park Avenue, New York 17, N. Y.

Send information on:
- ☐ TERGITOL 12-P Nonionics
- ☐ FLEXOL Plasticizer Z-88
- ☐ Glyoxal Special
- ☐ Physical Properties of Synthetic Organic Chemicals

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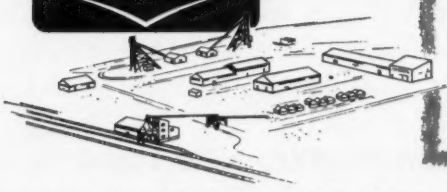

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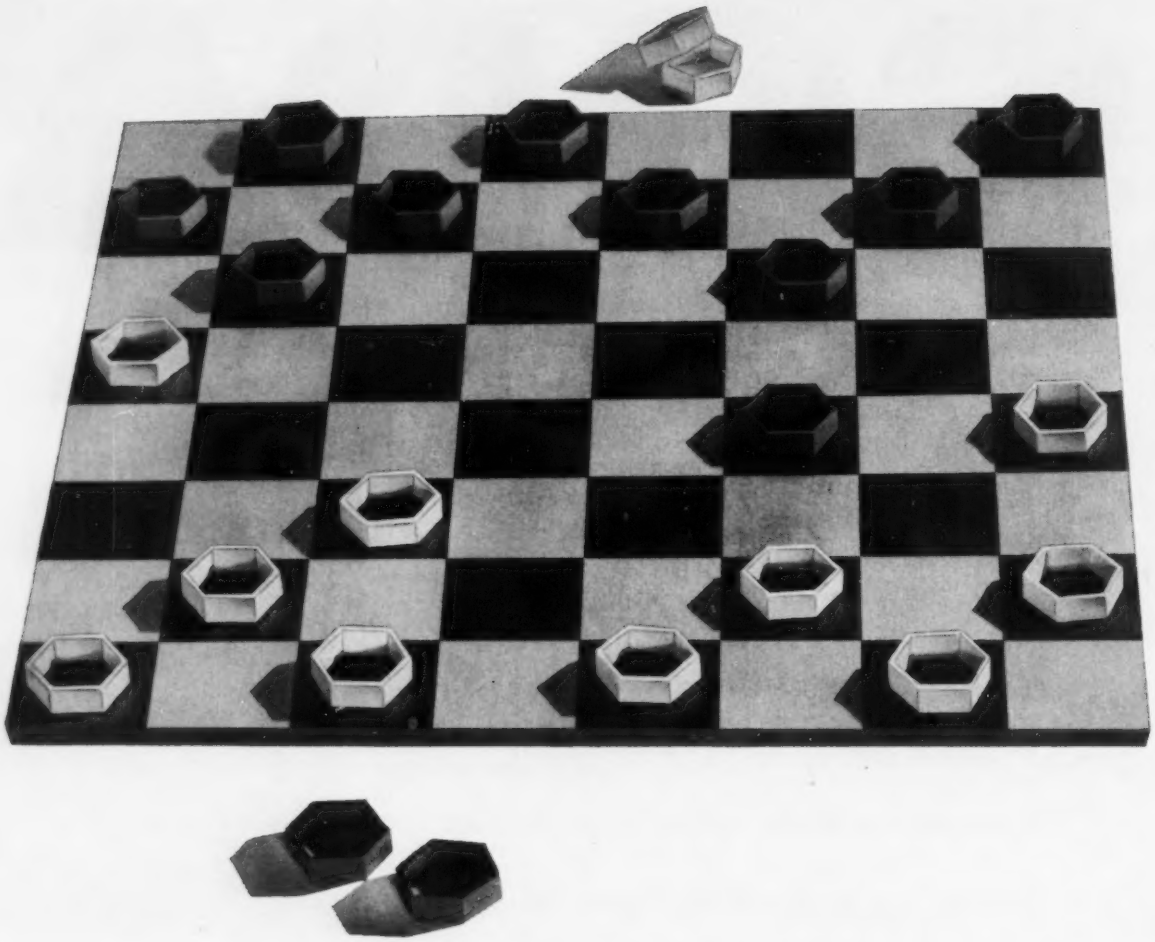

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In this dramatic era of speed and space, research and development, one right move can reveal a host of practical new possibilities . . . particularly in the realm of organic chemistry.

That move is your continuing challenge . . . ours too. Perhaps, as others have, you can meet yours with some of our organic intermediate chemicals.* Certainly their possibilities in your project bear investigation. Why not send for information on those that interest you, as well as our latest catalog?

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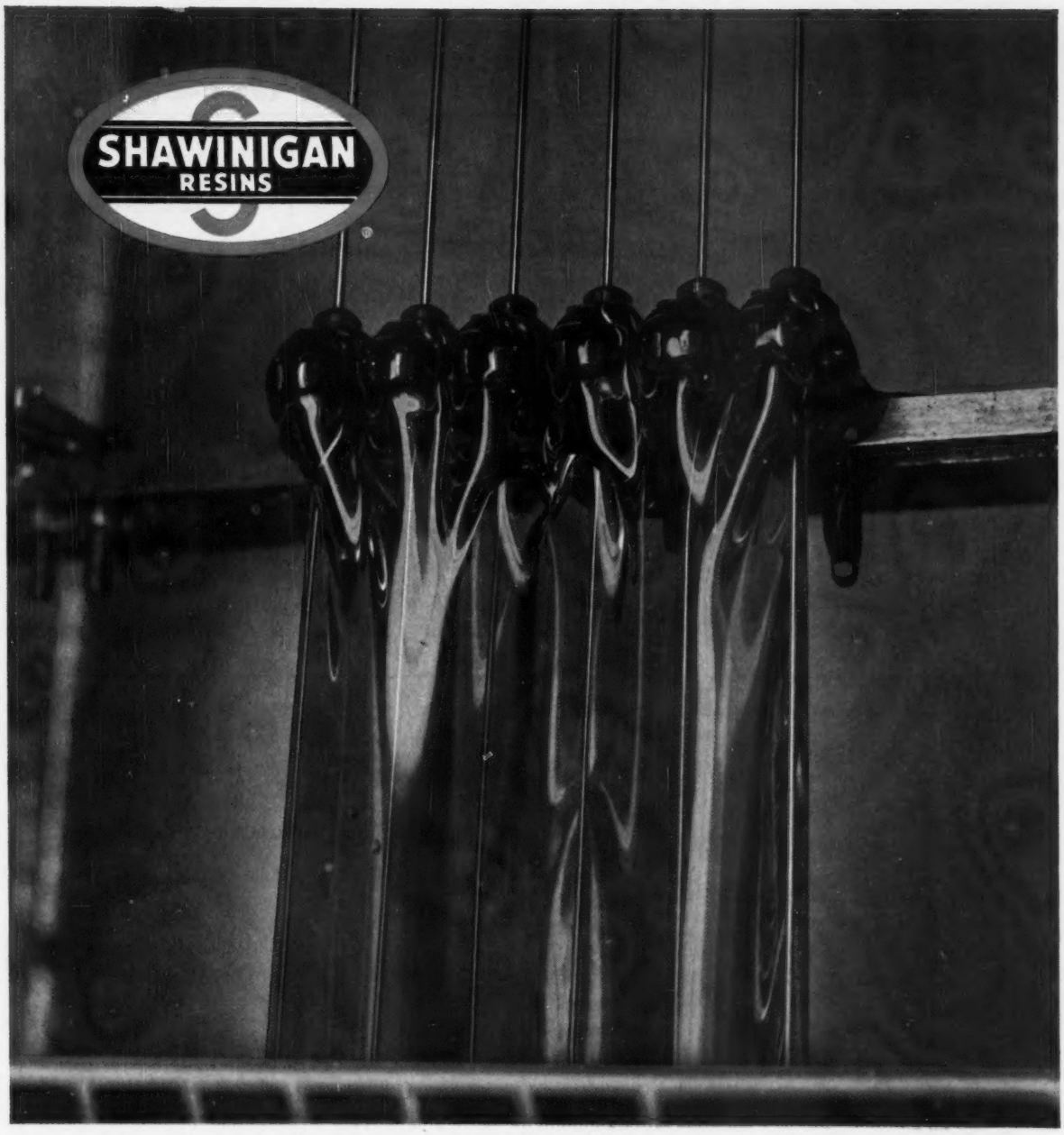

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How Shell's new PENToXONE* and PENToXOL* solvents can save money, improve formulations and eliminate the need for specialty high boilers

SHELL's PENToXONE and PENToXOL are unusually active high boiling solvents.

Together, they constitute a virtually complete high boiler inventory.

Below is solubility data for 30 important resins in PENToXONE and PENToXOL solvents.

With *acrylics, nitrocellulose* and *alkyds,* these new Shell solvents can improve your formulations.

With *vinyls,* PENToXONE lowers solvent cost and improves odor.

With *thermosetting acrylics, epoxies* and *cellulose acetate butyrate,* both PENToXONE and PENToXOL give excellent film properties.

In *urethane systems,* PENToXONE solvent has low isocyanate reactivity, eliminates need for premium priced upgraded solvents.

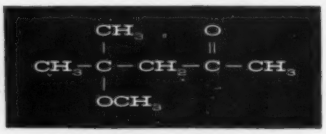
In *polyvinyl butyral lacquers,* PENToXOL can lower solvent cost by 11¢ per gallon and almost double water resistance.

If you'd like to receive samples, plus technical bulletins on all of these applications, write any of Shell's nine Industrial Chemical Division Offices, or directly to Shell Chemical Company, 110 West 51 Street, New York 20, N. Y.

Solubility of resins[1] in Shell's PENToXONE and PENToXOL solvents.

Resin	Supplier	PENToXOL* Solvent	PENToXONE* Solvent
		Viscosity, Cps., 25°C	
Nitrocellulose			
R.S. ½-Second Grade, Eight Grams per 100 Mls	—	100	67
S.S. ½-Second Grade, Eight Grams per 100 Mls	—	58	38
Acryloid A-21, 15% Weight	Rohm & Haas Co.	30	22
Acryloid B-44, 15% Weight	Rohm & Haas Co.	25	20
Acryloid B-66, 15% Weight	Rohm & Haas Co.	25	15
Acryloid AT-50, 30% Weight	Rohm & Haas Co.	90	63
Bakelite BKS-2600	Union Carbide Plastics Co.	87	46
Amberol F-7	Rohm & Haas Co.	37	19
Methylon 75108	General Electric Co.	11	5
Beetle 227-8	American Cyanamid Co.	31	26
Uformite F-240	Rohm & Haas Co.	11	7
Beckamine P-196	Reichhold Chemicals Inc.	14	8
Cymel 248-8	American Cyanamid Co.	19	11
Uformite MM-55	Rohm & Haas Co.	23	14
Resimene 872	Monsanto Chemical Co.	29	16
Cellolyn 102	Hercules Powder Co.	18	9
Amberol 801	Rohm & Haas Co.	32	17
Aroplaz 2480	Archer-Daniels-Midland Co.	27	24
Rezyl 412	American Cyanamid Co.	13	14
Cellolyn 502	Hercules Powder Co.	25	19
Cellolyn 582	Hercules Powder Co.	17	12
Duraplex ND 77B	Rohm & Haas Co.	42	31
Aroplaz 6006	Archer-Daniels-Midland Co.	27	23
Cycopol 102	American Cyanamid Co.	80	62
Half-Second Butyrate 10% Weight	Eastman Chem. Products, Inc.	117	75
Vinylite XYHL, 5% Weight	Union Carbide Plastics Co.	55	—
Parlon P	Hercules Powder Co.	1260	630
Bŭton 200	Enjay Chemical Co.	45	31
Epon® 1002, 50% Weight	Shell Chemical Co.	898	240
Epon® 1007	Shell Chemical Co.	229	107

(1) Commercially available resin reduced to 30 per cent weight solids, except as indicated. Viscosities of resulting solutions measured in absolute units with capillary tube viscometers.



Remarkable activity of Shell's PENToXONE high boiling solvent comes from this unique keto-ether structure. The COC of ethers and the double bond O of ketones combine for double action solvency.

Shell's PENToXOL solvent is a very closely related glycol ether.

Both these solvents are true high boilers. PENToXONE'S total evaporation time is 2450 seconds. PENToXOL'S is 3375 seconds.

*Shell Trade Mark.

SHELL

Shell Chemical Company

Industrial Chemicals Division

Business
Newsletter

CHEMICAL WEEK
December 9, 1961

Competition will get rougher for the synthetic rubber industry and its chemical suppliers. That was predicted this week in New York by Goodyear Tire & Rubber's J. D. D'Ianni. Occasion was the 54th annual meeting of the American Institute of Chemical Engineers in New York.

D'Ianni underscored three powerful economic forces that will make for a "highly competitive situation" in both industries: (1) competition between natural *(See p. 101)* and synthetic rubber; (2) competition among the various synthetics; (3) the "more than adequate" production capacity and the many producers of petroleum-derived raw materials for synthetic rubber.

One bright spot in the half-decade ahead, though, is the belief that despite competition, 80% of the total U.S. rubber requirements will be filled by synthetic rubber. (Currently, the synthetic-natural rubber ratio is 72%-28%; last year synthetics sliced out 69% of the market.)

•

Another boost for U.S. vinyl acetate monomer capacity is in the works. Early this week Monsanto's Hydrocarbons Division said it will build a 45-million-lbs./year plant at Texas City; the design and construction contract has gone to Scientific Design (New York).

Output of the unit (to be completed by late '62) will be consumed by other Monsanto installations producing vinyl plastics and emulsions.

The division's assistant general manager, F. E. Reese, notes that the new acetate plant "provides another connecting link between the company's raw material resources and its finished products." The monomer will be made from acetylene produced at Texas City and acetic acid derived from acetylene to be made at Chocolate Bayou, near Alvin, Tex.

Monsanto is the fourth company in recent months to decide to move into vinyl acetate monomer production. Other prospective newcomers: Borden Chemical, National Starch, and Tenneco. These new plants, plus capacity of present producers, will hike total U.S. acetate monomer potential to well over 550 million lbs. by the end of next year.

•

Is Du Pont's knowhow being "leaked" around the world? This week, in U.S. District Court at New York, Du Pont and its Argentine affiliate, Ducilo, brought suit against Von Kohorn International Corp. (White Plains, N.Y.), three of its principal officers, and a Von Kohorn affiliate in Germany. The charge: that Von Kohorn—an internationally active engineering firm—has been using secret data on Du Pont polymer processes in design and construction of plants in various nations, including the Soviet Union, Yugoslavia, Germany, Japan, and Argentina.

More specifically, the complaint asserts that Von Kohorn hired eight or more persons then employed by Ducilo, and that some of those persons took with them confidential information about Du Pont's processes. That information, Du Pont charges, was used by Von Kohorn to design and build plants for nylon, cellophane, Dacron polyester fiber and Mylar polyester film; and as the basis for patent applications.

At press-time, President Henry Von Kohorn of the White Plains concern declined to comment, explaining that he had not seen the complaint.

•

Spencer is now in adhesives. A deal in which Spencer acquired all the assets of 62-year-old Perkins Glue Co. (Lansdale, Pa.) was closed late last week. Terms called for the exchange of 51,204 shares of Spencer common stock, and operation of Perkins as a wholly owned subsidiary.

•

The Gulf Coast is bustling:

Du Pont will build an ammonia unit at its Victoria, Tex., plant to supply the company's local requirements. Construction will begin next year; production is expected to start in late '63.

Air Reduction has plans for a new nitrogen-oxygen plant at Beaumont, Tex. Cost will be more than $2 million. The unit will go up on a 10-acre site adjacent to the Du Pont plant at Beaumont. A major part of the liquefied nitrogen production will be fed to Du Pont by a short pipeline. (Du Pont now gets Air-Reduction nitrogen via tank trucks from Houston.) Oxygen to be made at the new installation will be sold to others.

Dow is "rehabilitating" magnesium production units at Freeport, Tex. Two of the eight Texas Division Plant B magnesium electrolytic cell buildings (closed since early '58) will be put back into operation by Jan. 2.

The company is producing magnesium at full capacity in its Plant A and whittling inventories to meet sales needs. Inventory is approaching "a good working level," says Texas Division General Manager Earle Barnes, and additional capacity will be needed.

•

Hercules Powder will spend several million dollars to expand nitrogen chemicals production at its Missouri Chemical Works (Louisiana, Mo.).

The construction program will get under way immediately. While completion is expected by early '63, some nitrogen derivative production units will start up as early as mid-'62.

Missouri Chemical Works was bought by Hercules in '54 from the U.S. Government. It was then an anhydrous ammonia producer. But expansions by Hercules have included units for methanol, formaldehyde and pentaerythritol. The latest expansions will process ammonia further to yield urea, urea solutions, urea-ammonium nitrate solutions, prilled ammonium nitrate and other agricultural chemicals.

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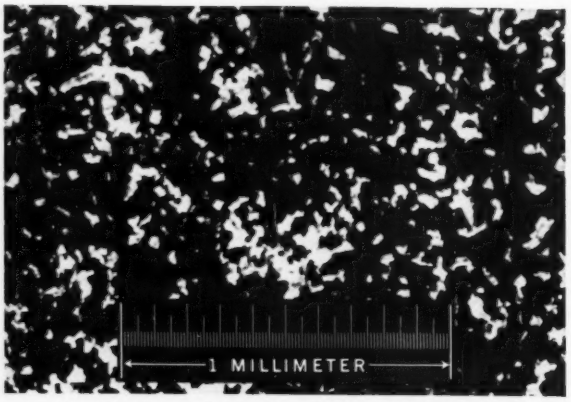
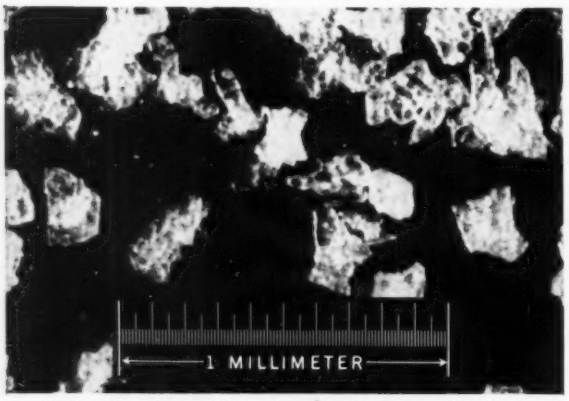
42 Mesh	Trace	200 Mesh	35.0%
100 Mesh	.5%	325 Mesh	70.0%
170 Mesh	20.0%	400 Mesh	80.0%



Sodium Bicarbonate U.S.P. Fine Powdered No. 3DF for use specifically in dry powder fire extinguisher mixes, also in rubber and plastics blowing, lubricant for sheet vinyl.

TYPICAL SCREEN ANALYSIS
CUMULATIVE PERCENT RETAINED BY

170 Mesh	Trace	325 Mesh	25.0%
200 Mesh	2.0%	400 Mesh	45.0%



Sodium Bicarbonate U.S.P. Granular No. 5 for use in effervescent salts, other pharmaceuticals and special types of cleansers.

TYPICAL SCREEN ANALYSIS
CUMULATIVE PERCENT RETAINED BY

42 Mesh	Trace	100 Mesh	92.5%
65 Mesh	27.0%	170 Mesh	99.0%
80 Mesh	66.5%		

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TYPICAL SCREEN ANALYSIS
CUMULATIVE PERCENT RETAINED BY

42 Mesh	Trace	200 Mesh	35.0%
100 Mesh	.5%	325 Mesh	70.0%
170 Mesh	20.0%	400 Mesh	80.0%

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Seated above from the left at a recent meeting: Richard P. Klopp, Vice President—Sales; W. Graham Jamison, Vice President—Administration and Treasurer; George F. Klein, Vice President—Engineering; Alan T. Knight, President.

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3M Surfactants are stable within a wide *thermal* range; some resist heat up to 700° F. Some are completely *inert to chemical attack*, forming stable foams in strong acids, bases, oxidizing and reducing agents. They *defy high-energy electrolytic decomposition*, so that surfactant effects are now possible in some hitherto impossible systems such as chrome-plating baths. 3M Surfactants also are stable in the presence of *biological* material. And, the perfluorocarbon tail, which is highly *resistant to radiation attack*, may open new vistas in atomic research.

3M Surfactants are provided as wax-like solids, free-flowing powders or liquids, and function at much lower concentrations than conventional surfactants. For more information see the "profile" at right, then fill out and send us the coupon below.

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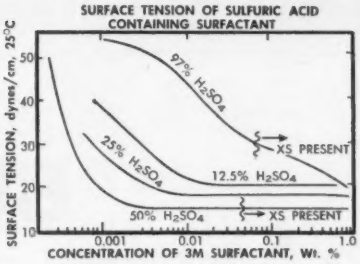
Chemical and Thermal Stability. Exceptional stability in the presence of heat, strong acids and bases, oxidizing and reducing agents can be built into 3M Surfactants. In some cases they resist temperatures of 700° F. **Strong acids:** some 3M Surfactants can be refluxed for 48 hours in 50% H_2SO_4 with no evidence of decomposition or change in surface tension. **Bases:** 3M Surfactants have been used in 50% Sodium Hydroxide at 150° F. **Oxidizing agents:** There are 3M Surfactants that withstand 90% Hydrogen Peroxide. **Reducing agents:** tests show no damage to certain 3M Surfactants even when used in 95% Hydrazine.

Surface Activity. The extremely low surface energy of the fluorocarbon chain of a 3M Surfactant allows attainment of **surface tensions** of less than 18 dynes/cm. . . . at least 10 dynes per cm. lower surface tension than any other surfactant.



And the unprecedentedly low concentrations avoid many of the bad side-effects that arise when working with conventional surfactants. (See diagram above.) (H_2SO_4)

3M Surfactants reduce **interfacial tensions** easily . . . even between acids and organic liquids that defy conventional surfactants. In actual test, the interfacial tension between 50% H_2O_2 and OIL has been lowered to less than 1 dyne per cm. by the addition of only 0.05% by weight of 3M Surfactant to the peroxide phase.

Excellent **leveling action** without moisture sensitivity is possible in paints, waxes, coating materials of many types, because 3M Surfactants reduce surface tensions at very low concentrations. In the matter of **foaming power** they offer a distinct advantage by being able to form stable foams in liquids such as strong acids, bases, oxidizing and reducing agents which destroy conventional organic surfactants. They effectively produce stable **emulsions** of small particle size.

Concentration Requirements. 3M Surfactants function at much lower concentration than conventional surfactants. For example, .001% by weight of a 3M Surfactant will reduce the surface tension of water to 30 dynes per cm. It would take .1% by weight of a typical Alkyl Benzene Sulfonate to do the same job!

CHEMICAL DIVISION

MINNESOTA MINING AND MANUFACTURING COMPANY

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BULLETIN:

Shell has increased benzene production to meet your rising needs—capacity now exceeds 80 million gallons per year

Shell has increased its benzene production nearly 500 percent in less than 18 months. Shell's benzene-producing capacity in the U. S. is now the largest in the world.

Shell's stepped-up output comes to you via a nationwide supply network served by 3 refineries.

Read how Shell's increased benzene production can help you meet your rising benzene requirements now.

WITH DEMAND for benzene at an all-time high, and with new uses coming along each year, Shell is producing more benzene now than ever before.

Bigger supplies now

Shell has stepped up production of benzene again. Shell's capacity has already topped 80 million gallons of high purity benzene. *And Shell has nationwide facilities for producing and distributing benzene.*

Widest distribution

Shell Benzene is produced at three refineries. At Wood River, Illinois; Houston, Texas; and Wilmington, California.

NOTE: All three refineries are located near waterways. You can take delivery of Shell Benzene in barges, in tank cars and transport trucks. Deliveries can come direct from the refinery.

Manufacturers choose Shell Benzene when precise control is vital. Its quality is consistently high.

And it is free of Thiophene.

For full facts on Shell Benzene, contact your Shell Industrial Products Representative. Or write: Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

SHELL

A BULLETIN FROM SHELL
—where 1,997 scientists are working to provide better products for industry

Chemical Makers Cut Fatter Dividend Melon

Although this year's chemical profits will be little, if any, better than last year's, there is convincing evidence this week that chemical companies will increase cash dividend payments in calendar '61 by more than $50 million. This would bring the industry total to a new peak of about $1.26 billion on the Securities & Exchange Commission scale (*upper chart at right*), or about $1.09 billion on the Dept. of Commerce scale (*CW Business Newsletter, Dec. 2*).

And the financial community is already watering at the mouth for an even bigger dividend melon from makers of chemicals and allied products next year. For example, one market counselor—Arnold Bernhard & Co., which puts out the comprehensive "Value Line Investment Survey"—last week advised its clients to expect the chemical industry to boost net income by a whopping 16% next year, compared with an all-industry gain of 12%; and to expect an average increase of 7% in chemical dividends in '62, compared with a 5% rise in cash dividends on all stocks. Next year's sales, that firm predicts, will be up 10% for the chemical industry, 8% for all industries.

Payout Rate Mounts: Meanwhile, more chemical companies are jumping on the higher-dividend bandwagon, despite this year's prosaic profits. And this, of course, accelerates the chemical industry's dividend payout rate, which now seems likely to hit 62% or more this year (*lower chart at right*).

As boards of directors are always more inclined to increase dividend rates than to pare them, and as total profits fluctuate with the economic cycle, the big year-to-year differences show up most sharply in the industry's retained earnings.

This portion of profits now seems likely to drop $30-40 million this year, to about $765 million on SEC's tabulation; but could vault to a new record of close to $1 billion next year if the predicted boom materializes.

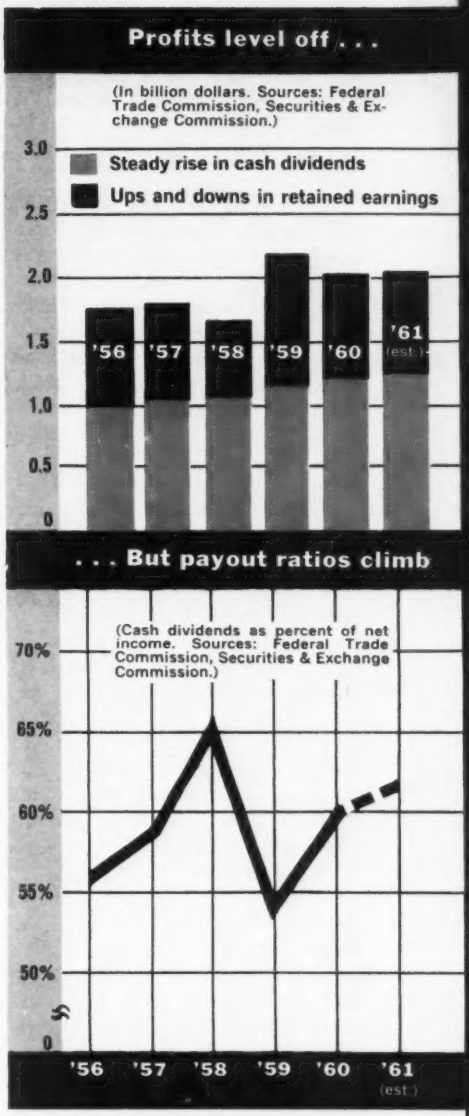
At least four of the 10 largest U.S. chemical companies are paying bigger per-share cash dividends this year than in '60. Biggest increase, of course, is the 75¢ hike in Du Pont's year-end dividend; this alone will result in an approximately $34.5-million rise in cash dividend payments. Celanese will be paying 10¢/share more than its $1.10/share total last year; Dow and Pfizer each boosted this year's payments 5¢/share, to $1.45 and 85¢/share, respectively. These 10 companies* last year accounted for 43.5% of the chemical industry's total net income, and about 50.8% of the industry's cash dividends. Their payout rates last year ranged from Monsanto's 38% to Du Pont's 81%, averaged 67.4%.

Across the Board: Among the industry's middle-size producers, at least seven have upped their '61 per-share cash dividends. Topping these increases: the 21¢/share boost that brings Eastman Kodak's '61 dividend total to $2.25/share.

Commercial Solvents, U.S. Borax & Chemical, and Wyandotte Chemicals are each treating stockholders to a 15¢/share rise. Witco Chemical has hiked payments the equivalent of 10¢/share (on the basis of holdings before last year's 50% stock dividend); and Koppers also is posting a 10¢/share increase. FMC Corp. is upping its '61 common stock dividends 5¢/share.

And at least nine of the leading pharmaceutical companies are writing bigger dividend checks this year. Heading this list: Miles Laboratories, with a 30¢/share increase. Others whose boards have declared higher dividends for '61 include Norwich Pharmacal, up 20¢/share; Bristol-Myers, up 15¢/share; American Home Products, up 12¢/share; Plough, Schering, and Searle, each up 10¢/share Warner-Lambert, up 5¢/share; and Upjohn, up 4¢/share.

* The other five: Allied Chemical, American Cyanamid, Hercules Powder, Olin Mathieson and Union Carbide.



Specialty Makers Too: Smaller companies and producers of chemical specialties have been joining the parade. Among the dividend increases for '61: American Rubber & Plastics, up 45¢/share; Drackett Co. and Urethane Corp. of California, each up 30¢/share; Canadian Celanese, up 20¢/share; Helene Curtis, up 15¢/share; Cook Paint & Varnish, up 10¢/share; and Catalin Corp., Lawter Chemicals, and Purex Corp., each up 5¢/share.

Two companies producing metals and chemicals—American Smelting and Refining, and American Metal Climax—raised '61 per-share dividends 20¢ and 15¢, respectively.

Cutbacks in per-share dividends this year have been scarce. In this cate-

gory are American Agricultural Chemical, down 30¢/share; Carter Products, down 25¢/share; Arizona Fertilizer & Chemical, down 18¢/share; and Reichhold Chemicals, down 10¢/share.

And a score or more of chemical and specialty companies are issuing new stock to shareholders, either as dividends or in stock splits. These issues range from 2% stock dividends, such as the one declared by Kawecki Chemical, to several three-for-one stock splits, such as those proposed by Miles and Drackett. These moves—along with stock issues for acquisitions—all tend toward a further snowballing of cash dividends next year.

Banking on a Boom? In many cases increased per-share dividends appear to be pegged largely to prospects for brisk business through the next six months or more. Most of the chemical companies that are paying the higher dividends this year have not formally committed themselves to regular rates at the new levels, but have simply declared higher per-share payments for this year-end quarter without giving any assurance about future dividends. Some boards of directors have explicitly labeled their increases as "year-end extras."

Du Pont's big increase falls in that category; the company's board of directors declared a $3 dividend for this quarter, instead of the $2.25 dividend paid one year ago. Wall Street had expected Du Pont to top last Decembers' dividend by 50¢, inasmuch as General Motors had declared a 50¢/share extra and Du Pont's policy has been to pass through to its own stockholders the entire amount of all GM dividends, net of taxes. The additional 25¢/share in Du Pont's current dividend appears to reflect the company's strong financial position—its total surplus now is nearly $2.5 billion, up 8.5% since last Dec. 31—and its optimism for '62 (*CW, Dec. 2, p. 28*).

The recent flock of higher dividend declarations poses a problem for other boards of directors. They'll be under increasing pressure from stockholders to follow suit; and this pressure will be especially intense for companies with low payout ratios and those that have cut dividend rates during the past few years. Some companies may feel impelled to adopt dividend rates that can't be maintained if the anticipated boom fades out next fall.

Hooker's Bryant: Betting on new products to produce profit upturn.

Looking to Better Days

Sales volume is rising for Hooker Chemical (New York), and this trend is expected to continue through first-half '62, company President F. Leonard Bryant told New York security analysts last week. While Bryant is optimistic for next year, predicting that sales will climb more than $10 million to more than $160 million and that earnings will improve, he made it clear that Hooker management is disappointed in the fiscal year ended Nov. 30.

In the fourth quarter, just when the sales upturn aroused hope that Hooker would at least be able to equal or nearly equal its '60 performance, an electric furnace broke down at the Columbia, Tenn., Phosphorus Division plant. Result: loss of 50% of the company's phosphorus production for about one month, and a cut of "a few cents per share" off fourth-quarter earnings.

Prospects for '62: But Bryant ticked off at least five reasons for anticipating that—after two years of declining profits—the tide will turn in '62. The Phosphorus Division will be in better shape than ever when a new electric furnace goes onstream at Columbia next week, increasing elemental phosphorus capacity by 50%. The '62 outlook for caustic soda and chlorine—two of Hooker's biggest products—is "rather bullish." Operating efficiency at Niagara Falls, N.Y., will be enhanced by recently completed installation of new mercury cells to provide for the company's increasing captive requirements for chlorine. And operating costs at that big plant will be trimmed by virtue of new electric power rates, with savings expected to reach about $750,000/year.

And finally, there are prospects for various new products that are expected to start paying off next year. These would include a nematocide, several organic phosphorus compounds for which Hooker holds process patents, a product that's said to flameproof cellulosic fabrics and garments permanently and economically, several degreasing and phosphatizing compounds for metal working industries, a urethane flame retardant for wall panel construction and insulation, and a chlorinated carbon product that's billed as a fire retardant for plastics and also as a possible insecticide for use against fire ants. Sales of Hooker-developed new products have been doubling each year, Bryant said, hitting about $3 million in '61.

De-emphasizing Mergers: It's in new products, such as these, that Hooker expects to do most of its growing over the next few years, Bryant told a Wall Street audience of about 175. During the past seven years, Hooker has accomplished much of its growth through four major acquisitions: Durez Plastics and Niagara Alkali in '55, Oldbury Electro-Chemical in '56, and Shea Chemical in '58.

The company added two smaller acquisitions within the past year and a half—Butler Chemical in '60 and some phosphate properties in Tennessee in '61—and it's now discussing a possible merger with Parker Rust Proof Co. (*CW, Nov. 4, p. 47*). But Bryant reiterates that the great bulk of future growth will come from within.

Bases for that growth, he went on, include an expanding research and development program and the $100-million five-year plan launched in '59. Research expenditures in fiscal '61 rose 5%, to about $4.5 million; the $3.5-million laboratory opened in '59 is already filled and an expansion is planned; and a $2-million semi commercial plant is nearing completion. Capital expenditures in '61 neared $25 million, an all-time record for the company; and an additional $16-18 million is budgeted for '62.

Looking Abroad: Hooker is stepping up its foreign activities, Bryant continued, and "several interesting overseas projects are in various stages

of negotiation." He said the company is nearly ready to decide on a proposed phosphate rock mining venture in Mexico.

Believing present competitive problems are here to stay, Hooker management is prescribing "more aggressive marketing, more efficient production, more selective research, and forward diversification into upgraded product lines where we have specialized skills, such as in fire retardants," Bryant declared.

He said it's difficult to attain the traditional chemical industry goal of $1 in yearly sales volume for every $1 invested if the company sticks to basic industrial chemicals such as chlorine and caustic. The answer, he said, is to upgrade those basic products and to keep operating rates as high as possible. Hooker now takes about half of its own chlorine output for captive use in upgraded compounds, he said; and within about three years, Hooker expects to be using the entire output for both its present phenol plant at North Tonawanda, N.Y., and its new phenol plant due onstream early next fall at South Shore, Ky.

Set for Fiscal Growth

Union Carbide is reinforcing its top-level financial management, splitting the posts of secretary and treasurer (previously held by one man) and creating a new office, that of controller.

John F. Shanklin—who has been treasurer since 1954 and secretary since '59—has been elected a corporate vice-president. He will continue to serve as secretary and as a member of the operating committee.

William S. Sneath becomes Carbide's new treasurer. He had worked in the corporation's general accounting department for more than 10 years until last May, when he was named assistant secretary and assistant treasurer.

Chosen for the new post of controller is John A. Willis, who had been an assistant secretary and assistant treasurer since '56.

With Carbide's annual sales volume past the $1.5-billion mark and likely to reach $2 billion within the next four years, financial responsibilities have been multiplying. Cash flow, for example, has about doubled in the past 10 years.

Crane's Kanter: Well-behaved yttrium can obviate magnesium's fireworks.

Yttrium Weds Iron

If yttrium nodular iron is as successful as developer Crane Co. (Chicago) expects it will be, demand will rise, not only for yttrium but possibly also for the rare-earth metals with which yttrium is usually found.

In nodular iron, an additive such as yttrium causes graphite particles in the iron to assume a compact nodular form. This enhances the iron's ductility.

Crane's J. J. Kanter—in a paper presented at last week's American Society of Mechanical Engineers meeting in New York—said that as much as 80% of magnesium (now the main additive for nodular iron) vaporizes at iron casting temperatures. Therefore, he reasons, magnesium for this application is expensive, despite its relatively low cost (35-40¢/lb.). Yttrium, on the other hand, is sold by Vitro Chemical (New York) at $20-25/lb., and 3-5 lbs. of yttrium are required for producing 1 ton of nodular iron. Since nodular iron sells at a premium $160/ton, and no yttrium is wasted in process, Crane expects to sell valves and accessories made of yttrium nodular iron (tradename: Flex-Iron) on a competitive basis.

Approximately 150,000-200,000 tons of nodular iron are sold each year and sales are increasing. Even a fraction of this business would please the stockpiled yttrium producers. And a market for yttrium would lead to lower prices on co-product rare earths, provide new incentive for developing additional applications.

Surprise in Brazil

In a blow at hopes for stimulating foreign investment, Brazil's House of Deputies last week passed a bill drastically curbing activities of foreign capital and sharply limiting remission of profits.

The surprise move was a sharp defeat for Premier Tancredo Neves' government, which had earlier endorsed a milder bill seeking to encourage reinvestment and greater Brazilian participation in foreign companies through tax incentives. Instead, the lower house passed a stiff version originally authored by leftist Deputy Sergio Magalhaes, and apparently supported by industrial forces averse to foreign competition.

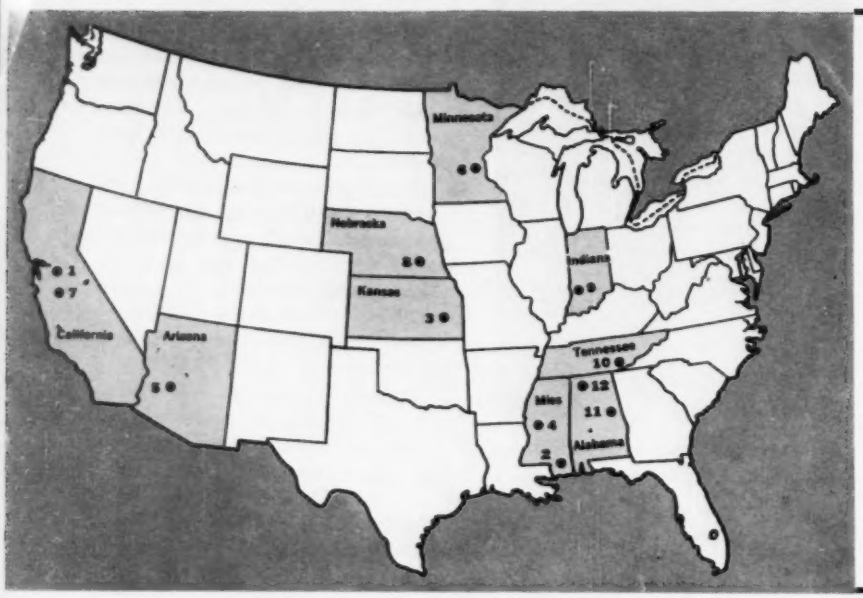
The bill: (1) limits profits remission to 10% of capitalization; interest payments on loans to 6%; (2) restricts capital repatriation to 20% annually; (3) outlaws sale of Brazilian companies to foreign concerns; (4) forbids foreign banks from maintaining deposit accounts except when home countries grant reciprocity to Brazilian banks; (5) sets up a five-man Foreign Investment Council with powers to decide where and by whom foreign investments may be made in Brazil.

Foreign and Brazilian business circles term the bill shocking and outrageous. They point out that the capital base for figuring profits is value in cruzeiros—as established by the Investment Council—and this does not take into account dollar loss through internal inflation. Also, they feel the all-powerful Investment Council, which will make its own rules, offers juicy opportunities for graft.

Immediate effect may be to dry up foreign investment flow, at least for the 4-6 months before the Senate acts. Strategy of the bill's opponents seems to be to bottle it up in the dominantly conservative Senate rather than risk amendments, which the House could override. But the labor party leader threatens a move to unseat the government if an attempt is made to block passage.

Neves is reported saying the bill is "diametrically opposed to government economic policy." But leftists have maneuvered the government into a corner, where opposition to the bill can be popularly interpreted as favoring foreign corporations against Brazilian interests.

Location and capacity of co-op and government ammonia plants



		Capacity, thousand tons/year
1	California Ammonia Co. Lathrop, Calif.	45
2	Coastal Chemical Co. Pascagoula, Miss.	140*
3	Cooperative Farm Chemicals Lawrence, Kan.	132
4	Mississippi Chemical Co. Yazoo City, Miss.	117
5	Southwestern Nitro-Chemical Chandler, Ariz.	35
6	St. Paul Ammonia Products Pine Bend, Minn.	85
7	Valley Nitrogen Producers Helm, Calif.	60
8	Consumers Cooperative Hastings, Neb.	70
9	Central Nitrogen, Inc. Terre Haute, Ind.	122**
10	Farmers Chemical Assn. Chattanooga, Tenn.	70†
11	Farmers Chemical Assn. Childersburg, Ala.	70†
12	TVA, Sheffield, Ala.	90

* Includes expansion now in progress.
** Proposed. † Under construction.

Co-ops Move on Fertilizer Markets

Farm co-operatives are on the march this week to capture a bigger slice of the total U.S. market for nitrogen fertilizers.

Three big new projects, in various stages of development, plus planned additions to existing plants, promise to boost capacity of co-op-owned or -controlled ammonia plants to more than 1 million tons/year — perhaps 1.25 million tons/year — by '63. Depending on the growth of private capacity in the same period, this would represent 14-17% of the total U.S. ammonia capacity. In comparison, co-ops produced about 9% of all U.S. fertilizers three years ago (*CW, May 17, '58, p. 83*).

Four co-ops—Illinois Farm Supply (Bloomington, Ill.), Indiana Farm Bureau Cooperative Assn. (Indianapolis), Farm Bureau Cooperative Assn. (Columbus, O.), and Central Farmers Fertilizer Co. (Chicago) are firming up plans for an ammonia plant (reportedly 350 tons/day) at Terre Haute, Ind. (*CW Business Newsletter, Oct. 7*). Proposed name for the venture: Central Nitrogen Inc. Other products will be ammonia solutions, ammonium nitrate and nitric acid. Officials are now negotiating for a natural gas supply. Products of the new unit will be marketed in the Midwest and Intermountain areas.

Illinois Addition: Efforts to form a semicooperative nitrogen venture in downstate Illinois are well under way, spearheaded by Earle Hughes of Anna, Ill. Tentative plans call for 150 tons/-day of ammonia capacity, with other units for ammonium nitrate and solutions. Capacity would be expanded later.

The group has received equipment bids and is lining up sponsors. The leaders plan to pattern the venture after Mississippi Chemical Co. (Yazoo City, Miss.), selling part of the output to co-op members and putting the rest on the open market. Completion is still probably two years away.

Mississippi Chemical, which has attained a strong position in the deep-South fertilizer market, is continuing to grow. Its subsidiary, Coastal Chemical Co. (Pascagoula, Miss.), is doubling its ammonia capacity to 140,000 tons/year.

Southern Marketer: Farmers Chemical Assn. (Chattanooga, Tenn.), recently set up by four Southern co-ops, is completing details for leasing the Army's Alabama Ordnance Works at Childersburg, Ala. Earlier FCA leased the Volunteer Ordnance Works (Chattanooga, Tenn.) for 25 years, with an option to renew for an additional 25.

Girdler Construction Co. (Louisville, Ky.) has been awarded a contract to convert the Volunteer Works by adding ammoniating and ammonium nitrate facilities to the existing nitric acid units. Completion of the $8.5-million project is due late next year.

When both the Alabama and Volunteer plants have been converted, they will each have 70,000-tons/year ammonia capacity. Later ammonia capacity of both plants will be doubled, FCA says, and urea production units added at one of them (as yet undetermined). Total investment over the next 10 years could run as high as $25 million.

The co-ops backing FCA are Cotton Producers Assn. (Atlanta, Ga.), Tennessee Farmers Co-operative (Lavergne, Tenn.), Farmers Co-operative Exchange (Raleigh, N.C.), and Southern States Co-operatives (Richmond, Va.) Together they cover a large part of the big Southern market.

FCA's chief officers are the general managers of the four co-ops: D. W. Brooks (CPA), chairman, Franklin Nix (TFC), president; W. T. Steele, Jr. (SSC), and G. D. Arndt (FCX), vice-presidents.

Substantial Savings: Chairman Brooks last week gave some indica-

tion of the economic impact of the FCA venture when he addressed the CPA annual meeting at the Atlanta Merchandising Mart. He asserted that the Volunteer plant will produce ammonium phosphate, nitrogen, and ammonium nitrate "at a cost of about half what we're now having to pay for these chemicals." He added that the output of the new FCA plant "will double the net annual income of our (CPA's) fertilizer division."

Brooks later spoke confidently of the effectiveness of the co-op's research program when he told of a CPA "breakthrough" — a patented process "that eventually will lower the cost of fertilizer $6-8/ton all over the world." He did not elaborate.

Tax Outlook: One key factor in the co-ops' growth rate is the possibility of change in the tax laws. To quailfy as a co-op a company must do at least 85% of its business with its stockholders, and operate on a cost-of-service basis. Profits resulting from services given or goods sold are returned to the stockholder patrons and are not subject to corporate taxes.

In '51, Congress passed a law that it thought would insure that such profits would be taxed in the year they were earned. But court decisions since then have held that noncash allocations of patronage dividends (scrip) could be deducted by the co-op, and also that these dividends were not taxable income for the patrons until they were paid off.

The net result of this deferred-payment situation has been that the co-ops have had extra equity capital. A tax bill to be taken up when Congress convenes next month contains a provision that dividends issued in scrip be redeemable for cash within 90 days. The co-ops would be allowed to deduct these payments from income, but they would be taxable income for the stockholder. Scrip not redeemed immediately could not be deducted by the co-op until paid.

This bill, which the House Ways and Means Committee tentatively approved last summer, would follow the recommendations of the President that provisions be written into the new law to make it conform to what Congress thought it had enacted.

The co-op part of the next tax bill is not highly controversial, but most of the other parts of the over-all tax bill are, so its future is uncertain.

Chemicals Newcomer

Nypac, Inc. (Elizabeth, N.J.) — founded last December by a former employee of Eastman Kodak—is well on its way toward emulating Eastman in product diversification. Like its expansive competitor, the former produces chemicals and pharmaceuticals as well as cameras, photographic film, and photocopying equipment and materials.

Lyle O. Brown—38-year-old president of Nypac—showed his wares to a gathering of newsmen in New York City's Overseas Press Club last week. Chemical products already in production include monochloroacetone (tear gas) and a derivative intended for use as a perfume base; certain special vitamin products, such as one used for injections to induce blood clotting; various iodinated organics for injections in patients undergoing radiology studies; chemical couplers for use in color film processing; and a combination developer-fixer solution for photocopying machines. New chemicals under development: a pyridyl derivative to produce "twilight sleep," and several new derivatives of monochloroacetone.

Nypac has a tentative link with Fotochrome Inc. (New York), a processor of photographic film whose stock was listed on the American Stock Exchange last week. Frank Nadaline, Jr., Fotochrome chairman, has the right to buy 1.1 million shares—practically all that is now outstanding — of the stock of Nypac; and he has granted to Fotochrome a four-year option to buy that Nypac stock. Fotochrome is now buying various Nypac products for its own use and for resale; but Nypac is free to sell to any other distributing company.

Dynacolor Corp. (Brockport, N.Y.) has filed two lawsuits, one against Nypac and one against Fotochrome, alleging wrongful appropriation of trade secrets. Both suits are pending.

Nypac's Brown: Expanding in photographic and pharmaceutical chemicals.

Borrowing to Build

Monsanto Chemical—now building plants at the fastest pace in the company's history—has arranged to borrow up to $75 million next year to help finance the company's worldwide expansion program.

In January and May next year Monsanto will sell to an unidentified institution a total of $50 million worth of 4¾% promissory notes due Jan. 1, '93; and the company has the right to sell an additional $25 million worth of such notes at either closing.

Expenditures for new plant and equipment during '61 will total about $140 million, nearly $20 million more than last year's capital budget, according to company Controller Edwin J. Cunningham; and '62 outlays now shape up as another $140 million total. Depreciation is expected to climb nearly 8% this year, to about $82 million, and retained earnings will dip slightly, to about $40 million; thus these two cash-flow items will fall nearly $20 million short of covering '61 capital expenditures. Next year, Cunningham said, depreciation may rise to about $90 million.

3M Under Fire

A New Jersey manufacturer of electrical insulation products has filed a complaint in federal district court at Newark, N. J., charging Minnesota Mining & Mfg. and three others with violations of the antitrust laws.

New Jersey Wood Furnishing (Woodbridge) alleges, "Defendants have unlawfully . . . conspired to restrain trade in the manufacture, sale and distribution of electrical insulation products." It names as defendants 3M, Irvington Varnish & Insulation (a 3M division), Insulation & Wires, and Essex Wire Corp. Insulation & Wires was purchased by 3M from Essex in '56, and later—as a result of an FTC action—sold back to Essex.

national roundup

Companies

American Mineral Spirits Co., division of Pure Oil Co. (Murray Hill, N.J.), plans to merge with W. H. Barber Chemical Co. (Minneapolis). Amsco manufactures and distributes aromatic solvents, petroleum naphthas and waxes; Barber markets industrial and agricultural chemicals and consumer products.

Nopco Chemical Canada (London, Ont.)—wholly owned subsidiary of Nopco Chemical (Newark, N.J.)—has purchased Canadian Aniline and Extract Co. (Hamilton, Ont.) for an undisclosed sum. Object: to broaden both companies' product lines. CAEC will operate as an independent subsidiary of Nopco.

Cerro Corp. (New York) stockholders have approved an increase in the company's authorized shares of common stock from 4.25 million to 6 million. President Robert P. Koenig says there are no plans for issuing any of the newly authorized shares, except for possible use of some of the new shares as stock dividends.

Koppers (Pittsburgh) has purchased 50% of the stock of General Industries, which operates under the name of General Homes (Fort Wayne). Purpose: to increase acceptance of Dylite polystyrene foam in the housing market.

Expansion

Soda Ash: Allied Chemical's Solvay Process Division (New York) plans to expand its dense soda ash plant at Baton Rouge, La., nearly doubling present capacity. Solvay also produces chlorine, caustic soda, and polyethers (in a new facility put onstream late this summer) at this site. The expansion is scheduled for completion next year.

Dichlorobenzene: Chemicals Refineries Corp., newly formed affiliate of Record Chemical Co. (Montreal), will operate a *p*-and *o*-dichlorobenzene plant at Napierville, Que. The plant's capacity will reportedly be enlarged as needed to supply the entire Canadian market —about 5 million lbs./year—and provide some material for overseas exports.

Petroleum Products: Standard Oil of Kentucky (Louisville) has awarded two contracts for its new, $125-million refinery being built at Pascagoula, Miss. (*CW Business Newsletter, Nov. 18*). Fluor Corp. Ltd. (Los Angeles) got the contract to build five of the major processing units, including a 100,000-bbls./day crude distillation unit, a 32,000-bbls./day catalytic cracking plant, an 18,000-bbls./day Isocracker, and a 19-mcf./-day hydrogen plant. Chicago Bridge & Iron Corp. (Chicago) will build the tanks with a total capacity of more than 7 million bbls.

And Cities Service (New York) will build a 2,500-bbls./day 'H-Oil' hydrocracking unit at its Lake Charles, La., refinery. The new unit is designed to convert high-sulfur residual oil into a synthetic sweet crude equivalent. Hydrocarbon Research (New York) has received the design, engineering and construction contract for the unit, which should be completed next fall.

U. S. Gypsum Co. (Chicago) this month will begin construction of a multimillion-dollar acoustical tile plant at Greenville, Miss. The new plant, which will employ about 125, is due to be completed by late '62.

foreign roundup

Sulfuric Acid/Singapore: Chemical Corp. of Singapore Ltd. has been set up by Singapore and Hong Kong interests to build a 7,000-tons/year sulfuric acid plant on the Bukit Timah industrial estate in Singapore. It's due onstream by Oct. '62.

Chemicals/Cuba: Red China says it will build 24 factories in Cuba over the next four years, including nine chemical and two textile plants. The others will also turn out industrial products. They'll be paid for out of a $60-million loan China granted Cuba last year.

Insulation/West Germany: France's Compagnie de St. Gobain is negotiating for an interest in German insulation material manufacturer Gruenzweig und Hartmann AG.

Fertilizer/India: Kothari & Sons (Madras) has been licensed to construct a $30-million nitrogen plant at Tuticorin, with the proviso that it double its 30,000-tons/year production within four years. The state agency, Fertilizer Corp. of India, is constructing an 80,-000-tons/year urea plant in Gorakhpur, Uttar Pradesh, and a 32,500-tons/year urea and ammonium sulfate plant in Naharkatiya, Assam. Three other state projects for fertilizer production are also under way.

Nylon/Britain: Dutch nylon producer Algemene Kunstizijde Unie has offered shareholders of British Enka a 45% stake in British Enkalon, a new subsidiary planning a $20.5-million nylon plant in Northern Ireland. Negotiations began this week. AKU recently sold its 55% share of British Enka, but shareholders were given the right to acquire a stake in British Enkalon.

DEMOCRAT Sarah Schoenkopf urges 'students' of Cyanamid's politics course to start political careers early.

REPUBLICAN Arthur Richardson says that first step in effective action is hard work for party of preference.

Preaching Practical Politics in the Plant

"Students" of American Cyanamid's political action class last week closed out their course with a company-sponsored dinner and talks by New York Democratic committeewoman Sarah Schoenkopf and Yonkers (N.Y.) Republican committeeman Arthur Richardson (above).

Similar scenes in home cities of chemical companies across the nation reflect management's mounting interest in politics. Partly because of the avalanche of government (national, state and local) taxation and controls, management now figures that indifference to civic and national affairs is poor business. Consequently, it has set out in earnest to train employees in politics, encourage them to seek part-time public office.

Moreover, individual company action is reflected in the tenor of recent meetings of the Manufacturing Chemists' Assn. At last month's session in New York City, MCA President John Hull and others aired the view that politics is now of grave concern to the chemical industry.

Voters' School: One of the programs used by some companies is the "Action Course in Practical Politics" plan offered by the Business Relations Dept. of the U. S. Chamber of Commerce. This course, for groups of 12-20 persons, consists of nine weekly two-hour workshops that are set up by sponsoring firms, service clubs, etc. Seminars deal with political party organization, the political precinct, campaigns, and the like. Tools are a discussion leader's manual, plus pamphlets for students.

American Cyanamid's courses (the firm has given 10 at its New York headquarters since last fall) are built around the Chamber of Commerce program. They are sponsored by the company's civic affairs department, headed by Donald H. Scott (former five-term mayor of Bloomfield, N.J.). The sessions are held at the company's various locations, and participants range from clerks to executives.

A typical graduate's comment: "I have offered to serve as an election district worker and am now looking into the possibility of joining one of the political clubs."

These voluntary courses are only part of Cyanamid's political program, however. Its company publications carry news of elections, background information on candidates and news of employee political activity. Plant managers are encouraged to allow workers a reasonable amount of time off for voluntary political work.

Cyanamid believes that its employees not only should "be free to par-

Allied's Hansen okays public office if it doesn't affect company duties.

Cyanamid's Donald Scott chose the USCC course on practical politics.

Monsanto's Charles Thomas urges CPI to contribute capable candidates.

ticipate in politics and government as a basic civil right but also should be encouraged to participate as a civic obligation."

Anthony McAuliffe, Cyanamid's vice-president for public relations and personnel, tells CHEMICAL WEEK: "Our aim is to help employees recognize and accept their citizenship obligations. We offer them instruction in the practical side of politics and then hope they will translate this education into action."

Monsanto Chemical Co. also bases its courses on the U.S. Chamber of Commerce plan. Board Chairman Charles A. Thomas states: "There is a growing need for an alert citizenry and for capable candidates for public office, and our action courses have succeeded, I think, in promoting good citizenship among our employees." Monsanto says its graduates attend more political meetings, perform more election-day work than they did before taking the course. Graduates also stepped up their political donations.

Numerous other companies have also adopted the Chamber of Commerce course:

• Hercules Powder Co. first offered its political-workshop program at the firm's home office in Wilmington, Del., next at the Wilmington Research Center and then at its plants in Parlin and Burlington, N.J., Port Ewen, N.Y., and Bacchus, Utah. By mid-'61, more than 300 employees had participated in the eight-week course.

• Action courses have been offered at Du Pont in the past 18 months. Several thousand employees have already completed the seminars during off-duty hours. Units throughout the company schedule the courses. Several graduates now hold state office; many more hold local political offices.

• A "pilot plant" trial of the action course was held at Allied Chemical Co.'s Solvay Process Division in July '61. The voluntary 17-week study was arranged for members of the Syracuse plant's supervisory staff and union officials affiliated with Local 12457, District 50, United Mine Workers.

Allied's secretary, Richard Hansen, says, "Allied believes that its people should exercise their rights and fulfill their responsibilities as citizens. This includes participation in civic activities and supporting the political parties of their choice, as well as being available for public office when this does not conflict with duties of their jobs."

• Dow Chemical Co. conducted the same course a year ago at its Midland, Mich., plant, gave 500 participating employees half-time off. Dow plans a survey to find out how many employees hold public office. In addition, Dow's Freeport, Tex., plant started a drive last year to encourage employees to pay poll taxes and qualify for participation in all elections. Result: an estimated 90% of eligible Dow employees paid poll taxes in an off-election year.

Other Tacks: Although employee courses are the most popular means of sparking political activity, some companies do it in plant newsletters and bulletin board memos.

Ethyl Corp., for example, has not conducted formal political - action courses within the company, but in '60 a lantern-slide presentation, "Know Your Congress," was arranged to urge employee-voters not to lose sight of the importance of the Congressional elections during the Presidential contest. And in '60 Ethyl won the American Heritage Foundation award for efforts to interest employees in politics, government and voting. All of Ethyl's political projects are nonpartisan and many of the firm's employees throughout the U.S. hold public office.

Another approach is taken by Tidewater Oil Co. (New York). It is showing a film "Communism on the Map," to all employees. Typical of viewers' concern—"What can we do about it?"—suggests the time is ripe for a follow-up course outlining suitable action.

In company newspapers Olin Mathieson Chemical Co. and Koppers Co. recently outlined basic U.S. political organization, urged employees to serve as part-time politicians in their communities. Bulletin boards and newsletters at Celanese Corp., Air Reduction, Chemstrand Corp., The Borden Co. and U.S. Borax carry news of employees' civic participation.

Change of Heart: But management hasn't always favored employee participation in politics. A few years ago the following admonishment was published under the heading "Political Activity" in one company employee manual: "Unusual activity on the part of any of our managers, clerks or em-

ployees in connection with any political questions of the day is forbidden . . . "We object to any persons connected with (the company), in any capacity whatever, making themselves conspicuous, or taking any part in any political organization or accepting a nomination for any office."

Many companies credit the Effective Citizens Organization (New York) with helping overcome such attitudes. Richard A. Armstrong, executive director of this nonprofit organization, states that its one major aim is to "foster management sympathy for people who want to participate in politics—management often balks at part-time civic work."

ECO, founded in '54, includes training programs for top management, encourages political projects for employees and serves as a clearing house for public affairs programs. The program is directed and supported by companies on a membership basis and lists Crown Zellerbach Corp., Dow Chemical Co., Ethyl Corp., Humble Oil & Refining Co., (New Jersey), Inland Steel Co., Monsanto Chemical Co., and Union Carbide Corp. among its supporters.

Government Jobs: Management approval of employees' participation in politics is creating a pool of successful office-holders. John Waddington, New Jersey state senator, is employed at the engineering headquarters of Du Pont's plant at Newark, Del. Another Du Pont employee, L. S. Grogan, manager of the silicone plant in Brevard, N.C., serves on the Brevard board of aldermen.

In last month's election Eric Gellerman, general foreman of the dyes department at Cyanamid's Bound Brook, N.J., plant was elected as a councilman in South Bound Brook. R. P. Barone, department chemist for the Bound Brook works was seated as committeeman in New Jersey's Woodbridge Township.

Olin Mathieson has employees serving in such public offices as mayor, city assessor, town council and committeemen, and hundreds (both men and women) serve on school boards, municipal councils and civic groups.

Dow employee C. M. Helpinstill is mayor of Freeport, Tex., and a member of various elective governmental agencies, including the school board, drainage district and navigation district. Other Dow employees serve on Texas statewide boards appointed by the governor. Among them: C. M. Shigley on the Texas Water Pollution Control Board and E. C. Stokley on the state board studying radiation hazards.

And political training is showing up in other ways. Clifford VanderWall, a vice-president of Ansul Chemical Co. (Marinette, Wis.), says that participation in an action course "showed me approaches for positive action other than running for office. I feel that I can do my part in serving my community and the country within the scope of my ability."

Action Pattern: Formal political action courses, such as the USC course (now in its third year with more than 100,000 enrollees in 50 states) are credited with a major role in sparking political participation.

The National Assn. of Manufacturers (New York) distributes "The Economic Background of Politics," a similar course designed for leadership training of middle- and upper-management people. Cost of materials: $5/set. Two other study courses are available: the "Political Education Reading Course," designed for home use (cost: $7/portfolio); and the "Seminar Program in Practical Politics for Management Personnel," a more detailed audio-visual study course for large groups (it includes manuals and materials for a six-session seminar).

In addition to chemical process companies' political encouragement of employees, many are lending support to civic groups—e.g., California's unique organization that trains young people in leadership, called the Coro Foundation. It offers 24 graduating college seniors the equivalent of a school-year course in government, business and politics, holds classes in Los Angeles and San Francisco. It is supported by about 100 contributors, most of whom donate $1,000 each, but no individual donation is more than $5,000.

The chemical process industries are represented on Coro's list by such companies as American Potash & Chemical Corp., Crown Zellerbach, Dow Chemical Co., Kaiser Steel, Standard Oil of California, Union Carbide Corp., and Union Oil of California. Like the CPI companies supporting the other political instruction courses in the U.S., they're betting such education is a good investment.

LEGAL

Insecticides Cleared: The U. S. Dept. of Agriculture has cleared Union Carbide Chemical Co's. insecticide, tradenamed Sevin (1-naphthyl-N-methylcarbamate), for use in sprays on citrus.

And the Food & Drug Administration has established a tolerance of 1 ppm. for Ethion insecticide on eggplants, peppers and pimentos. It is a product of Niagara Chemical Division of FMC Corp.

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Drug Control Precedent? A new proposal would, for the first time, take the responsibility for prescribing possibly dangerous drugs out of the hands of individual physicians. Dr. Edward L. Russell told a California State Senate Fact Finding Committee on Public Health and Safety that all drugs that may have adverse effects should be under the administrative control of the State Dept. of Public Health. Russell, an Orange County, California, health officer, concedes that self-discipline in such prescriptions is preferable to legislation, but he adds that legal restrictions on medical practice "are the eventual result when the profession demonstrates that it cannot or will not correct abuses."

State Senator John Thompson headed the hearing, which was called to consider whether use of Chloromycetin should be restricted. Use of the antibiotic (manufactured by Parke, Davis & Co.) has been associated with aplastic anemia (an often-fatal disease). The Food & Drug Administration requires enclosure of a circular in each package warning of this potential hazard. The drug is intended for critical, not minor, infections. But Russell says he has heard that it has been administered casually despite the warnings.

At the hearing, Dr. Philip Condit, state chief of communicable diseases control, observed that sales of Chloromycetin in California had risen from 250,000 grams in '54 to 2.9 million grams in '59 and that there had been a concomitant rise in the number of deaths from aplastic anemia. But he did not state that the drug was the cause of the deaths, only that there was an association in the statistics.

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Drug Suit: Warner-Lambert Pharmaceutical Co., Inc. (Morris Plains,

N.J.), has filed a complaint in U.S. district court in New York against Goldman Pharmacy, Inc., alleging that the pharmacy is selling "a counterfeit and spurious imitation of Peritrate" tablets. Peritrate is a drug used in the treatment of heart disease and is available only on a physician's prescription. It is made by Warner-Chilcott Laboratories Division of Warner-Lambert. According to the complaint, Goldman Pharmacy, doing business as Corner Pharmacy (1494 York Ave., New York) is selling counterfeit Peritrate when physicians prescribe the Warner-Chilcott product. The Warner-Chilcott suit has no connection with the criminal proceeding filed by the Food & Drug Administration last March 21 in Newark, N.J., federal court against General Pharmacal Co. (Hoboken, N.J.), alleging counterfeiting of several drugs (*see also, CW, Sept. 10, '60, p. 132*).

LABOR

Status Seekers: Local 598, International Union of Mine, Mill and Smelter Workers (Ind.) has accused International Nickel Co. of Canada (Sudbury, Ont.) of violating labor relations legislation by refusing to open negotiations for a new contract. After the first company-union meeting, T. D. Delamere, Inco spokesman, said discussions could serve no useful purpose until clarification of the status of the bargaining agent had been achieved. Status of the mine-mill local was challenged when United Steelworkers of America (Canadian Labour Congress) conducted a recruiting campaign among the local's 16,000 members. The steelworkers' union claims it has signed up enough workers to apply for certification (*CW, Dec. 2, p. 62*).

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Taft-Hartley Twist: United Steel Workers of America has accused Roane Electrical Furnace Division of Tennessee Products & Chemical Corp. (Rockwood, Tenn.) of discriminating against union employees. The charge, filed with the National Labor Relations Board in Atlanta, Ga., claims the discrimination resulted from union complaints of unsafe working conditions at Roane.

The union states that Roane fired 415 employees Sept. 7 and two weeks later 165 other men for not reporting for work. A union spokesman said that only a few of the safety hazards pointed out to the company in past months have been corrected.

NLRB Official William J. Raines said a rarely used section of the Taft-Hartley law involving safety hazards undoubtedly will be cited in the case. Meanwhile, NLRB assigned Denis R. McCarthy to investigate the charges.

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Higher Minimum Wages: Secy. of Labor Arthur J. Goldberg reports increases, under the Walsh-Healey Act, in minimum wages paid by companies producing miscellaneous chemical products and preparations. Increases apply to contracts offered by the federal government after Dec. 4.

The industry has had a minimum rate of $1.15/hour since Sept. 25. For the future it has been divided into two sections.

Products Group 1, with a new minimum of $1.42/hour, includes specialty cleaning, polishing and sanitation preparations; surface-active agents, finishing agents and sulfonated oils and assistants; and agricultural chemicals.

Products Group 2, with a minimum wage of $1.80/hour, includes adhesives, glues, mucilage, cements and sizes; gelatin; household tints, dyes and bleaches; bluings; writing inks; essential oils; industrial compounds; automotive chemicals, and evaporated salt.

KEY CHANGES

Richard B. Schneider to the board of directors, Great Lakes Chemical Corp. (Los Angeles).

E. Gifford Upjohn, M.D. to chairman of the board, **R. T. Parfet, Jr.,** to president and general manager, The Upjohn Co. (Kalamazoo, Mich.).

William E. Quigley to vice-president, The Anaconda Co. (New York).

Robert L. King and **Stanley M. Rumbough, Jr.,** to the board of directors, Rexall Drug and Chemical Co. (Los Angeles).

Thomas I. Mulroy to vice-president and member of the board of directors, L. E. Carpenter & Co. (Wharton, N.J.), producer of vinyl plastic wall coverings and upholstery materials.

Calvin O. English to plant manager at Wayne, N.J., Union Carbide Plastics Co. (New York), a division of Union Carbide Corp.

Leo J. Amorosi to vice-president, Norda Essential Oil and Chemical Co., Inc. (New York).

Arthur C. Haselow to president, **John D. Schmerein** to vice-president, Gilbert Paper Co. (Menasha, Wis.), division of The Mead Corp. (Dayton, O.).

Jess E. Dew to vice-president, John Deere Chemical Co. (Tulsa, Okla), ammonium phosphate producer.

Howard E. Walker to director of research, The Flintkote Co. (New York), producer of building materials.

Frederick K. Kleen to treasurer, **Cleve McCarty** to general sales manager, National Phosphate Corp. (New York).

Robert T. Means to vice-president, Carlon Products Corp. (Aurora, O.), producer of plastic pipe and fittings.

Paul Gibson to manager, Flake Hydrogenation Catalysts, Nuodex Products Division (Elizabeth, N.J.), Heyden Newport Chemical Corp.

Alexander B. Maley to chairman of the board, **Theodore H. Kritchevsky** to president, Intermediates, Inc. (Joliet, Ill.), chemical manufacturer.

Fred Cookson to vice-president and a director, Pierce and Stevens Canada, Ltd. (Toronto, Ont.), chemical manufacturer.

Allan Hoover, William Block and **Walter R. Lowry** to the board of directors, Kawecki Chemical Co. (Boyertown, Pa.), producer of rare metals.

Thomas M. Ware, president of International Minerals & Chemical Corp. (Skokie, Ill.), has been named by President Kennedy to serve on the board of trustees of the U.S. Freedom from Hunger Foundation. Heading the foundation are Harry S. Truman, Mrs. Woodrow Wilson, Mrs. Eleanor Roosevelt.

John Charles Lukman to vice-president, Wica Chemicals, Inc. (Charlotte, N.C.).

George H. Elliott to president and a director, Allied Chemical Canada, Ltd. (Montreal).

SILICONE NEWS from Dow Corning

Skis, skies and skin

Cosmetic-grade silicones guard her glamour, protect your sales, too

A perfect day for skiing may be a harsh one for her complexion. Sun and moisture conspire to dry and chap her skin; wind tries to dull the luster of her hair. But thanks to her wise choice of toiletries containing Dow Corning *cosmetic-grade silicones*, her day is free of beauty cares.

Here's protection that lasts! Because silicones repel water, they are ideal for protective creams, lotions, powders, sun tan preparations. Such toiletries stay in place . . . turn back water-borne stains and irritants . . . won't wash away. Loss of natural skin lubricants is kept to a minimum. The skin is left free to "breathe" . . . to stay soft and natural looking. And because silicones also resist oxidation, cosmetics stay fresh, never turn rancid, powder won't cake.

Application is easier. Beauty preparations containing silicones spread smoothly and easily. Penetration is fast, requires no tedious rubbing in.

Equally important, cosmetics with silicones are soothing and pleasing to the touch, inviting to use, and never leave the skin sticky or slippery.

Beauty aids in aerosols are also made better products with silicones. Hair sprays, for example, resist the effects of humidity. Hair is made more manageable; takes on added softness and luster.

Is she pleased with the performance and protection silicone-rich cosmetics give her? No doubt about it. She's brand conscious and brand loyal . . . especially when you formulate with Dow Corning *cosmetic-grade silicones.*

Write Dow Corning Corporation for technical assistance or recommended formulations. Address Dept. 2824a, Midland, Mich.

first in silicones

Dow Corning

New Call for Tariff Cuts

Powerful international support for deep and sweeping cuts in the tariffs on industrial goods was voiced last week by ministers of the 37 member nations of the General Agreement on Tariffs and Trade (GATT). They met in Geneva to devise new approaches to more than 60 key trade and tariff problems.

Foremost is the problem of replacing the outmoded GATT mechanism of item-by-item reciprocal tariff cuts. Under the present system, members offer each other cuts in the tariffs of specific items. But the items on which one nation is willing to offer cuts are often not the items that its trading partners are most interested in exporting to that country. Upshot: long and tedious negotiations. It's a situation that nettles government officials and economists seeking a faster rise in international trade.

An alternative approach — mutual cuts on an across-the-board basis— is being tried with resounding success by the members of the European Economic Community (the Common Market). Many officials of member governments believe that this method should also be applied on a worldwide basis—specifically among the industrial nations of the non-Communist world, with special provisions for the developing nations that are just beginning to industrialize.

This, of course, is also the philosophy of the Kennedy Administration, which has been calling for a radical new trade policy that will cope with competition from the integrating nations of Western Europe and at the same time increase the West's unity and strength (*CW, Nov. 5, p. 21*).

At the GATT meeting, the ministers agreed to work towards this kind of trading system. No formal action was taken, and before such a system could become a reality it would have to be approved by each government. U.S. Under Secretary of State George W. Ball advocated urgent study of the idea by a special GATT subcommittee.

The major obstacle will probably be protectionist sentiment in the U.S., which the Administration will try to overcome in the upcoming fight over a new trade law.

But when the chips are down, opposition may also be heard from within the Common Market, despite the strong support voiced by its spokesmen at the GATT meeting. Many within EEC feel that if trade with the U.S. and other nonmembers were liberalized too much, the effectiveness of the Common Market would be "diluted." Nevertheless, it seems all but certain that radical new trade relationships lie ahead, provided the enabling U.S. legislation is passed.

Pressure on Prices

The Indian government and the three Western oil companies operating in India are at loggerheads over the government's new oil product pricing rules. How the controversy is resolved could have an important impact on future investment in India.

The companies concerned are Standard Vacuum, California Texas, and Burmah Shell. They supply the price-controlled Indian market with products from their Indian refineries—which operate on imported crude—and with products imported from their affiliates.

Last September, acting on the recommendations of a special oil price policy committee, the government ordered price decreases amounting to an estimated $31.5 million/year on major petroleum products, effective Nov. 1. The cuts are to affect both the posted prices paid by the oil companies for the products they import and the distributing and marketing charges on both imported and domestically refined products.

Actual consumer prices won't be lowered, because the government intends to capture the cuts by raising duties and taxes. It thus hopes to increase revenues and save on foreign exchange.

Several weeks later, the companies informed the government that they were unable to purchase products from foreign sources at below posted prices. But the Indian government feels that they can.

In a speech before Parliament a few weeks ago, Oil Minister K. D. Malaviya declared that Burmah Shell and Stanvac had admitted that the quantity of discounts available to them for imported crude is equivalent to the discounts demanded by India on products. These discounts, he asserted, "are undoubtedly also available in equivalent if not higher measure to their associated refineries in the Middle East."

But an oil company spokesman asserts that worldwide demand keeps the prices of middle distillates firm. Increasing refinery output would add to the current oversupply of gasoline.

The government has relented somewhat by permitting the companies to import products through March at the lowest prices they can get, not necessarily at the government's new ceiling. But the discounts on the distribution and marketing prices still apply, and must be absorbed by the companies.

And Oil Minister Malaviya warns that steps are being taken to make "alternative arrangements" if the Western companies fail to supply India's demands.

His warning was underscored by the November visit to India of Soviet Deputy Foreign Trade Minister B. A. Borisov. He said Russia is willing to step up its oil product exports to India—but only on a long-term basis.

If it reached the worst possible conclusion, the dispute could conceivably lead to the companies losing at least some of their Indian products market, and even their investments there. But, one oil company spokesman says, "We have too big an investment there, and it's too big a market, for us to let that happen if we can help it." And the Indian government, anxious to boost industry and attract investors, isn't likely to let things go that far.

Fourth Fire

West Germany last week had its fourth refinery fire of the last two months. The blaze, at Deutsche Shell's Godorf refinery, caused about $1 million damage and will keep the entire distillation until out of commission six to eight weeks. Shell will keep the refinery's Platformer and Hydrotreater running from stocks and imports.

The other fires broke out at Esso's Cologne and Hamburg refineries and in the Coellner Benzin refinery near Cologne.

Ameripol Micro-Black cuts rubber mixing time 20%...

steps up production at Bata Shoe

The Bata Shoe Company recently faced production problems in their winter line of footwear. When using free black, color contamination was delaying production. Whenever a light color run followed production of black items, Bata was forced to close the line while equipment was painstakingly cleaned. It was a time-consuming, messy job.

For Bata, the solution was a changeover to Goodrich-Gulf Ameripol Micro-Black Masterbatch. Using Ameripol 1605, the most delicate pastel shades now follow black with no contamination problems. And, equipment, employees and production lines *stay* clean. Mixing time has been cut from a two-stage to a one-stage operation, saving as much as 20% in time.

If you manufacture shoes, tires, camelback, coated fabrics or any other black rubber products, consider Ameripol Micro-Black Masterbatch for this three-fold payoff . . . *in production* by eliminating weighing and milling operations plus shortening mixing time . . . *in storage* by eliminating in-plant handling of carbon black . . . *in products* by assuring thorough dispersion of carbon black in the rubber for increased abrasion resistance, lower heat build-up.

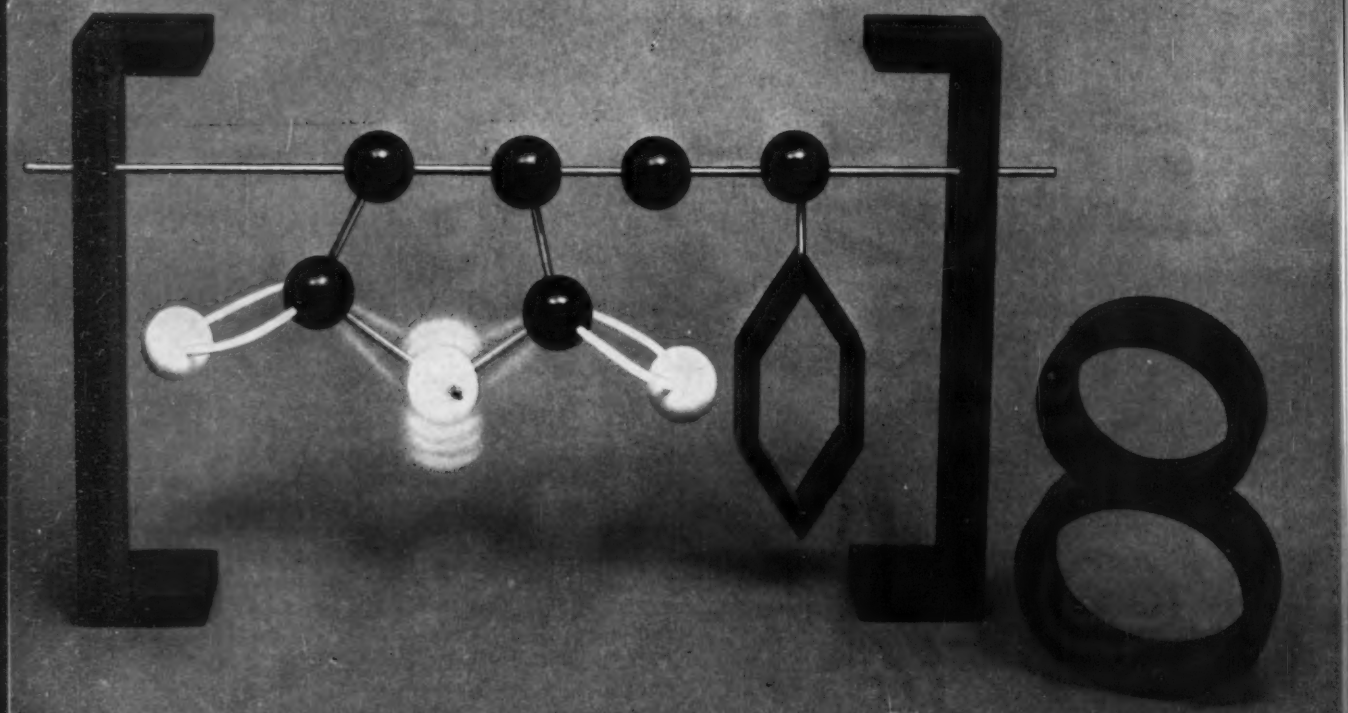
Put Micro-Black to work on your production line. Call your Goodrich-Gulf sales engineer. Or write us at 1717 East Ninth Street, Cleveland 14, Ohio.

Goodrich-Gulf Chemicals, Inc.

WORLD'S LARGEST SOURCE OF SYNTHETIC RUBBER

NEW SMA™ RESINS

THE SMA 1000A RESIN MOLECULE HAS AN AVERAGE OF ONLY 8 STYRENE-MALEIC ANHYDRIDE GROUPS.



POLYANHYDRIDE STRUCTURE: KEY TO CHEMICAL REACTIVITY

Chemical reactivity is an outstanding property of the SMA styrene-maleic anhydride resins. The anhydride groups along the short polymer chain react easily with alcohols to form esters; with alkalies to yield salts; with anhydrous ammonia to form the amide-ammonium salt; and with amines to form the amide-amine salt. SMA resins may be crosslinked with glycols, formaldehyde, formaldehyde-containing resins, or multi-valent metal cations to yield insoluble, three-dimensional thermoset-type materials. Samples and complete data available on letterhead request.

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Life Without Inventories: It's Hectic

Latest U.S. Dept. of Commerce figures show that chemical inventories have declined slowly but steadily during the past several months to the point where the seasonally adjusted figure for October should be about $4.19 billion. This compares with last August's $4.24 billion and Oct. '60's $4.18 billion. Customers are still keeping their inventories of raw materials at a minimum, relying on rush deliveries from suppliers to keep them going (CW, July 1, p. 25).

Reasons:

(1) Inventory ties up working capital that might be making more money elsewhere.

(2) Storage can be a problem, also costs money.

(3) With prices in many chemical lines generally declining, a company could suffer a loss by being caught with a large stock of a material when a price cut comes.

Buyers can currently operate this way because it's their market; the chemical distribution men agree that buyers won't begin to seriously build up their inventories again until such time—if ever—that the industry returns to a sellers' market. Many believe that the present hand-to-mouth way of doing business may become standard procedure. One West Coast sales manager says he doesn't think there will ever be an inventory build-up again in certain product lines. He says his customers have adopted a "supermarket" approach to the business—i.e., turn over goods quickly, keep cash investment at a minimum, and don't tie up money in goods which aren't actually in process and close to earning money. This usually means, he says, getting money back from raw-material investments within 30-60 days, not paying the raw-material supplier until you get your money—a very fast cash turnover.

Before the War: Although chemical sellers may be resigned to this situation, they are apparently not happy about it. In many cases they've been forced to a basic shift of emphasis within their companies. As Reichhold Chemicals' Donald Tuson put it, "It has put us back to the pre-'41 level." Prior to World War II a buyers' market existed in the chemical field and it became faddish to devise new approaches to inventory control, more economical distribution methods. While these techniques were still in their early phases of development, the war came, bringing a sellers' market that lasted till a few years ago.

During this period, emphasis was on production efficiencies: if a product could be made, it could be sold at a good profit, regardless of distribution problems. A few years before the buyers' market returned, chemical companies — intrigued by new equipment available to them, such as electronic data-processing machinery — began to tighten up on distribution and inventory control. However, as one sales executive remarks, until it became a vital matter this was "more a hobby than a policy."

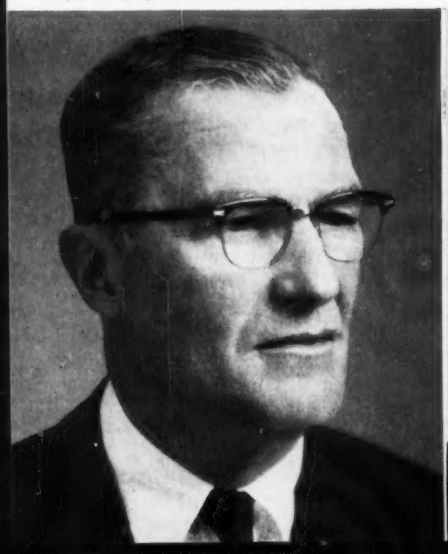
Now that distribution is again important, many companies are as close-mouthed about their new distribution and inventory control schemes as they once were about process information. One executive ruefully says of a competitor, "They don't have anything much different from what we or anybody else has, but they're afraid somebody will find out and they'll lose their advantage."

Necessity: Most chemical companies have similar systems for handling their distribution. The fact that a company has an IBM machine to process orders, control inventory and schedule production is now scarcely more startling than the fact that it uses typewriters. Says one marketing man: "The new inventory control systems don't save us money—they just allow us to continue to exist."

Although these systems for inventory control differ in detail, the factor that allows one company to cope with the problem better than others is an old business ingredient: management judgment. Monsanto's Robert Mueller points out, "The new emphasis on inventory has forced management improvement. The man in charge not only must understand the figures that come out of the machines but also must be able to make a good decision on the basis of those figures."

"With all the best systems," says W. R. Grace's Ralph Biondi, "there is still one big gap. You are dependent ultimately on a salesman's fore-

Allied's Armstrong: 'Data processing helps, but problems are critical.'



Monsanto's Mueller: 'The industry has been forced to improve management.'

Reichhold's Tuson: 'We're back to the pre-1941 type of buyers' market.'

McKesson's Hilderbrandt: Hopes buyers 'won't overload warehouses again.'

casts—what he thinks he can sell. If these are good, a pencil and paper do the job as well as a data-processing machine. If they aren't, pencil and paper are as undependable." Grace figures it has made progress toward solving this problem by having salesmen who know the accounts operating the home machinery and evaluating the forecasts.

However, there's no denying that electronic equipment helps, not only in executing management decisions but also in forming better decisions. One company discovered, by carefully going through its new data, that it might be able to get out from under the tight inventory problem by eliminating small-order customers. It found that of 5,100 invoices processed at one location, 2,700 were orders for less than 1,000 lbs. These orders accounted for less than 6% of the total sales volume. Further, the firm found that these customers formed the bulk of the faction that was causing a rush-delivery problem; larger customers, while also reluctant to carry raw-material inventory, at least programed their manufacturing so that they could place orders two or three weeks in advance.

What are sales worth? This gets close to the heart of views currently being aired in chemical distribution circles on "the cost of losing a sale." Some firms, naturally reluctant to lose sales, have frequently become overstocked while attempting to prepare for potential rush orders. Now, sales executives are bearing down, explaining to field forces the economics involved. The profit gained in making a sale might be overbalanced by the high cost of maintaining unrealistic inventories and production levels.

Another big area for management decision: how much of what to warehouse and where. Frequently a firm will find that it has a large stock of a given material at one location where it is not being sold, is short at another branch where it could be sold. Local warehouse people, who passed through the sellers' market, are frequently lax about reporting excesses, or even keeping track of them, often say nothing until excess inventory gets in the way.

This problem has been multiplied by the current need to maintain more warehousing points to insure fast delivery. Annual meetings of district managers now frequently emphasize short courses in inventory control.

Allied Chemical's James Armstrong, director of management engineering, reports that his worst problems in inventory control are in the company's Baker & Adamson fine chemicals division, and in the Buffalo, N.Y., dyestuffs plant. In both these cases, thousands of products in numerous package sizes must be adroitly manipulated about the country. In the case of dyestuffs, the additional problem of color forecasting and quick obsolescence must be taken into consideration. Armstrong reports that the electronic data-processing equipment helps a lot, but the problems are still critical, are still highly dependent upon the Achilles' heel of feedback from the field.

Centering the Ball: Naturally, all of this leads to more centralized control; actual sales have to be closely coordinated with production, and transportation and storage of goods have to be elaborately planned, frequently revised. One firm has decided that the only way of beating the new cost problem is to concentrate on sending consolidated shipments of mixed goods to local warehouses. This way it can keep close central control, save on freight rates, and have the right material in the right place at the right time. Unfortunately, however, the company reports, "every time we have a truck ready to go, a rush order is phoned in and we have to throw things out to make room for that."

Generally, as one distribution man puts it, "you can't get around it—all expedition costs money." There is some disagreement as to how much of the warehousing overhead should be included under inventory expenses, so estimates of these expenses vary considerably. A general rule followed in deciding if they are too high is whether or not investment in inventory is returning as much as investment in equipment used. Further complicating the question is indecision as to when to call a warehoused product obsolete (as a result of chemical deterioration, the initiation of a more favored product, or price cuts), and therefore something which should be written off.

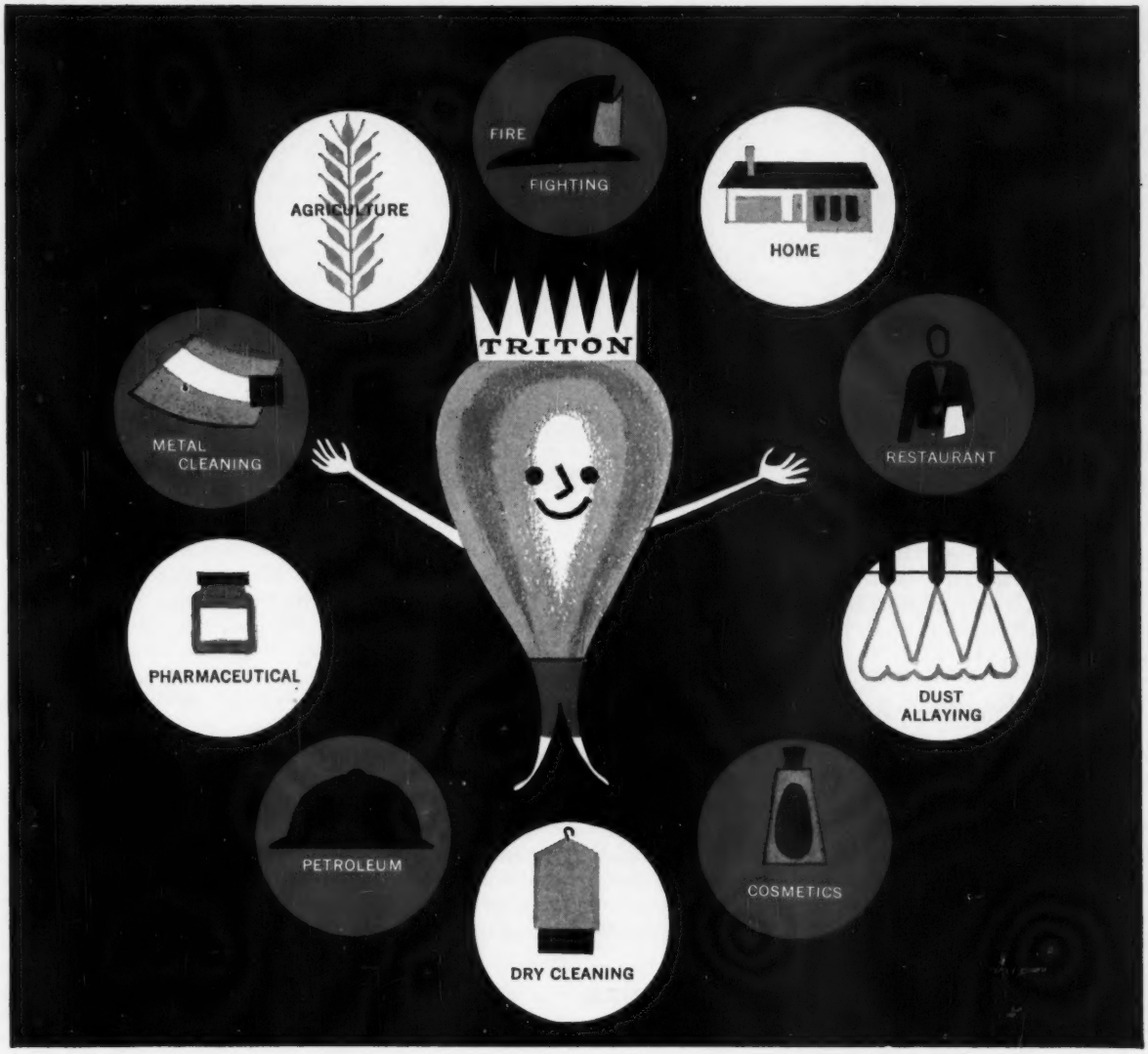
One segment of the industry that has benefitted from the situation is the distributor, whose organization fits neatly into current practices of getting small amounts to customers quickly. Dean Hilderbrandt, vice-president of McKesson & Robbins, says, "Our business is definitely much better," hopefully anticipates that chemical customers "won't overload their warehouses again." On reflection, however, Hilderbrandt concedes that "probably when things roar again, they will get back into the old groove."

Council to Sell Saran

Tee-Pak, Inc. (Chicago) and the Dobeckmun Division of the Dow Chemical Co. (Cleveland) last week got together and formed the National Ground Beef Council, Inc. Its function: to establish and maintain uniform standards for packaged fresh ground beef. First package to meet council standards: Tee-Pak's patented two-ply, air-tight package.

The purpose of the council is twofold: to promote Tee-Pak's new saran packages manufactured by Dobeckmun and to encourage increased confidence on the part of consumers and retailers in prepacked fresh ground beef.

Conventional wrapping for ground beef is cellophane. This is a clear film, used principally because customers can see what they are buying. But, Tee-Pak says, cellophane is permeable to oxygen, and aerobic bacteria cause the meat to turn brown and lose some flavor. The council claims that its new film package



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(which is opaque) is capable of extending the shelf-life of the meat up to seven days. In comparison, conventionally wrapped hamburger loses its freshness after a few hours.

The council will promote Tee-Pak's new packaging to consumers, primarily by working with meat packers. Sponsors of the council hope that it will be able to overcome any reluctance consumers might have to buy meat that they cannot see by stressing saran's protective properties.

The only corporate members of the council are Tee-Pak and Dobeckmun; but a six-member advisory board will consist of scientists and representatives of the meat and food industry. Five of these members chosen so far are Z. John Ordal, Dept. of Food Technology, University of Illinois; C. F. Niven, director of research of the American Meat Institute Foundation, University of Chicago; Thomas E. Griffith, Big Bear Food Stores; Max Lampert, president of Sommerville Meat Co.; and John Bard, director of research, Oscar Mayer Co.

Ground beef accounts for nearly 30% of all meat purchases. The council hopes it will be able to get its plastic film wrapped around a sizable proportion of the approximately 5 billion lbs. sold each year.

This isn't the first time Tee-Pak has helped promote customers' meat; last year, to help sell its sausage casings, the company set up National Hot Dog Week.

Radioactive Safety

A Canadian group is now writing a set of rules to regulate transportation of radioactive materials on highways. The Safety Subcommittee of the Canadian Nuclear Assn. met recently to draft the code at the request of insurance companies that wanted a better definition of their liability.

At a conference in Ottawa, Ont., Canadian federal and provincial public health officials exchanged views about possible hazards arising from the increased traffic in radioactive materials, although Canada has not had a single fatality resulting from radiation.

More than 60 delegates discussed existing legislation and gaps and overlaps in controls. They also proposed tightening of regulations governing transportation of radioactive materials and strengthening of protection against radioactive accidents and routine exposures in or out of industrial plants.

For the past eight years there has been a steady growth in the use of radioactive materials in industry, research and medicine. Since the first of the year the Radiation Protection Division of Canada's National Health Dept. — responsible for maintaining health standards in the handling of radioactive materials — has received more than 800 applications for approval of the use of radioactive isotopes. The Health Dept. is becoming increasingly concerned about the hazards to public safety of shipping these materials, particularly along trucking routes through heavily populated areas.

So far Ontario is the only province in Canada that has any statutory controls for truck transportation of radioisotopes. It was suggested at the conference that either a federal agency should fix uniform regulations or all ten provinces should adopt necessary protective measures.

In the U.S., transportation of radioactive materials is covered under the code of federal regulations governing the transportation of explosives and other dangerous materials.

Glass Gains

Despite some rather stiff competition from plastics, glass continues to gain in container uses. According to Glass Container Manufacturers Institute, shipments advanced almost 5% during the first nine months of '61 vs. the comparable period in '60. Glass container shipments totaled 16.4 billion units during the first three quarters of '61—an 800-million-unit gain over '60. Nonreturnable bottles for beer and soft drinks tallied biggest gains.

DATA DIGEST

• **Urethane Foam:** A new, 37-page booklet describing the properties, uses, handling and testing of a new urethane foam for low-temperature insulation applications is available from the Plastics Division of Nopco Chemical Co. (North Arlington, N.J.). The booklet furnishes data on physical properties, components, characteristics, pouring, density distribution, mold preparation, metering and mixing.

• **Styrene:** "Standard Practise in Handling Styrene Monomers," a new, 16-page Dow Chemical Co. (Midland, Mich.) bulletin, discusses styrene, vinyl toluene, divinylbenzene and alpha-methylstyrene monomers. Numerous charts and graphs are included, and inhibition, purification, hazards and their control, storage and handling are discussed.

• **Lead-Based Paints:** Recommended paint formulations and paint systems for a wide variety of exposures has just been published in a 32-page booklet entitled "Lead Pigments Technical Letter No. 15—Red Lead-Based Paint Systems." This new technical letter is a report of the results of almost 20 years of field-testing by the Lead Pigments Technical Committee and is a compilation of all previous technical letters issued by the committee. Available from the Lead Industries Assn. (292 Madison Ave., New York, N.Y.).

• **Textile Finish:** The use of Epolene polyethylene emulsions in textile finishing operations is the subject of a new, 30-page brochure published by Eastman Chemical Products, Inc. (Kingsport, Tenn.). The use of Epolene resins as both a finish for cotton and rayon and as a softener with cotton wash-and-wear finishing resins is described. In addition, the brochure gives details for the preparation of Epolene emulsions, including the selection of the proper surfactant that may be used.

• **Perfume and Flavor Guide:** A one-volume (736 pages; 62 photographs) work on natural raw materials for perfumes and flavors is now available from International Flavors and Fragrances' Steffen Arctander, its author. Part I of the volume describes processing of natural materials into basic perfume and flavor materials. Part II includes discussions of the appearance, botanical origin, production and processing, odor and flavor characteristics of the individual materials. Possible contamination, confusion, adulteration, availability and world production are also covered. Called "Perfume and Flavor Materials of Natural Origin," the book is priced at $12 (postpaid), is available only from the author at P.O. Box 114, Elizabeth, N.J.

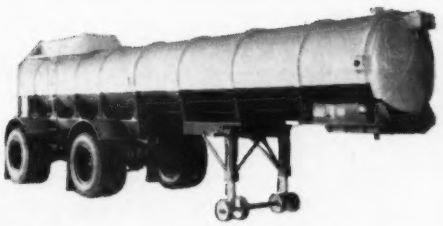
CUSTOMER TESTS PROVE

New Fruehauf Hopper Pressure-Type Tank-Trailer ... *Out-Performs Competitive Units!*

The discharge rate of Fruehauf's new Hopper Pressure-Type Tank-Trailer is phenomenal! In actual customer tests, a 720 cubic-foot unit loaded with Hi-Early cement was unloaded in just 26 minutes at a rate of 1,397 pounds per minute, over a horizontal distance of 76′ and to a vertical height of 30′! Salt, granular phosphates, ammonium nitrate prills, granular fertilizer components as well as cement may be successfully handled.

Fruehauf offers the industry's most complete line of Tank-Trailers. For over 47 years, Fruehauf engineers have been designing and producing superior units to meet the constantly changing requirements of chemical haulers.

In addition, Fruehauf's nation-wide chain of branches provides fast, efficient, competitively-priced service wherever your vehicles operate.



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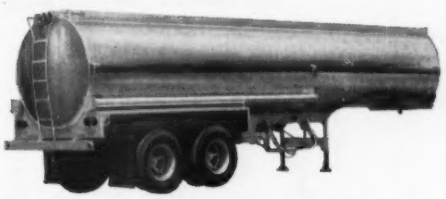

7100 SERIES ALUMINUM TANK-TRAILER
—for hauling chemicals, gasoline, fertilizer, kerosene, benzine, lubricating oils, alcohol, solvents, diesel fuel, and aviation fuels.

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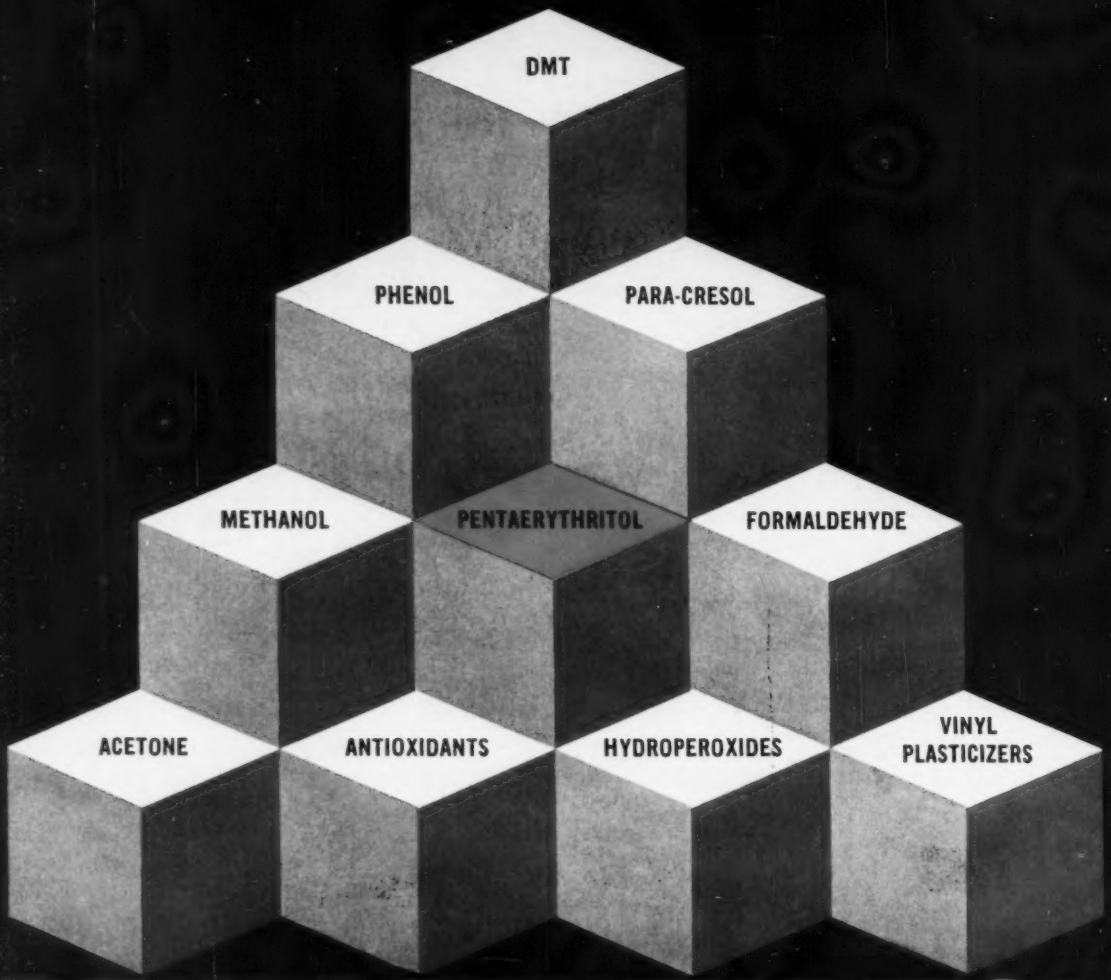

PENTAERYTHRITOL

HERCULES IS A PREFERRED SOURCE OF ORGANIC CHEMICALS

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Washington
Newsletter

CHEMICAL WEEK
December 9, 1961

Increased production of solid-fueled missiles is planned by the Administration for fiscal '63 (starting next July 1). Budget planners are putting the finishing touches on money requests to be sent to Congress in January—and they include more funds for such solid-fueled missiles as Minuteman, Polaris, Skybolt and Pershing. In addition, funds will be sought for the first time for development of a medium-range, solid-fueled missile to be used by NATO. At the same time, a slowdown is expected in spending for liquid-fueled missiles Atlas and Titan.

Over-all, the outlook is for a sharp increase in spending for defense procurement and research and development in fiscal '63. Procurement requests will total about $2 billion more than the $16.9 billion appropriated this year, and R&D requests will be at least $500 million over this year's $5.2 billion. Look for Congress to approve the full amounts—even perhaps vote extra funds, as it did this year.

•

Pay increases for government scientists and engineers may be forthcoming shortly. Civil Service Commission is studying such a move at the request of the National Aeronautics and Space Administration, which wants help in its campaign to recruit 2,000 extra scientists and engineers for the rapidly expanding space program. A decision is due by the first of the year.

NASA seems likely to get its wish. If it does, similar pay rises would be authorized for scientists and engineers in all other government agencies. The increases could amount to as much as $1,000/year, bringing government salaries more nearly in line with those paid by private industry.

•

Federal Trade Commission procedure is the real target of the district court suit recently brought by Procter & Gamble *(CW Washington Newsletter, Dec. 2)*. The company claims that FTC "improperly, unlawfully and capriciously" ordered further hearings by an examiner on its acquisition of Clorox Chemical Co. The examiner started the hearings last week despite P&G's request that the court enjoin such proceedings. No date has been scheduled for a court hearing.

Ordinarily, the courts give such regulatory agencies as FTC broad discretion in conducting their business. But a court decision in favor of P&G would sharply narrow FTC's methods of ruling on complaints that come before it.

•

A contractor for the fourth saline-water conversion plant to be built by the government's Office of Saline Water will be chosen by Christmas. Bids for the million-gallon/day demonstration plant at Roswell, N.M., must be in by Dec. 12. The unit will use a forced-circulation

vapor-compression system. One conversion plant is operating at Freeport, Tex. Others are under construction at Webster, S.D., and San Diego, Calif. A fifth will be built at Wrightsville Beach, N.C.

•

Industry is trying for special concessions in anticipation of President Kennedy's new foreign trade policy proposal. He has tentatively decided to ask Congress to overhaul the Reciprocal Trade Agreements Act. In an effort to shield themselves from initial effects of lower tariffs, representatives of industry groups are pressuring for a variety of protection schemes—e.g., imported quotas, or a stiffer "buy-American" policy.

Included are producers of aluminum, copper, rubber, fertilizer, oil, coal, wool textiles and electrical machinery; the Administration already has promised cotton textile producers some relief. But the industry groups are hardly likely to get all they seek. A big help will be a policy of buying as much at home as possible in carrying out the foreign aid programs—this the Administration intends to do.

•

The rise in the price of silver, following President Kennedy's order last week ending Treasury silver sales, seems certain to be of a long-term nature. But government officials are hopeful the price will stabilize after wide fluctuations during the first weeks after the order is carried out. Where the price will stabilize is anyone's guess at this time. But Sen. Frank Church (D., Ida.), a leader of the Western "silver bloc" in the Senate, thinks it will be about $1.10/oz. on world markets. The recent price has been 91-92¢/oz., but it jumped to $1/oz. following Kennedy's order.

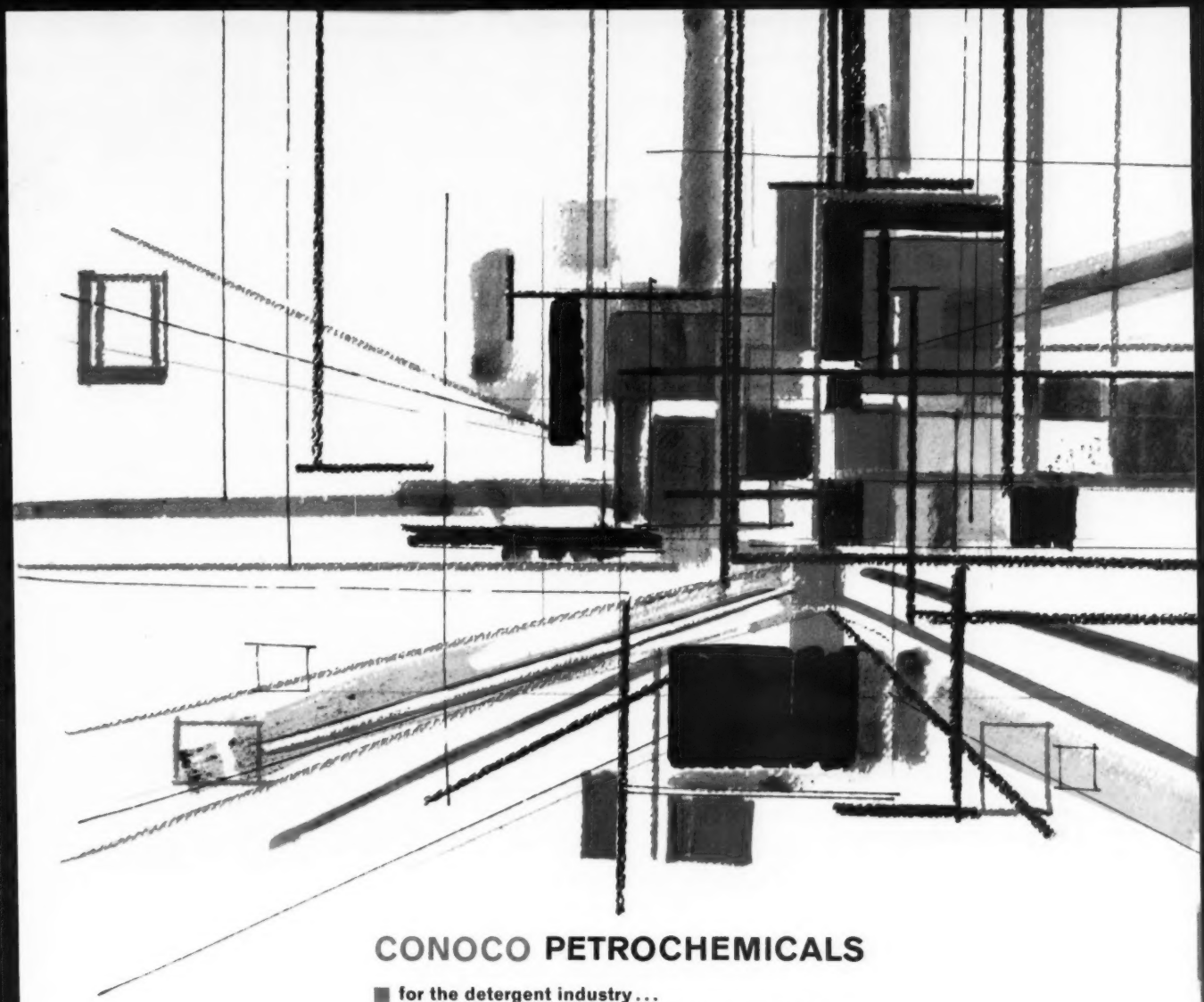
Industrial users of silver, particularly producers of photographic film, will feel the effect of a higher silver price almost immediately *(CW, Nov. 4, p. 146)*. Government officials concede that U.S. operations in the last few years have acted as a brake on the tendency of silver price to rise on world markets. If Congress next year approves the President's request to repeal the Silver Purchase Act of '34, as seems likely, a free market will be assured for silver to find its own price level.

•

New types of plastics and other chemical products may result from a research program under way at the National Bureau of Standards. NBS is working on the use of gamma radiation under high pressure to produce polymers from nonpolymerizing monomers. So far it has achieved results with such materials as perfluoroheptene and carbon disulfide.

•

The Pentagon has upgraded the status of chemistry in its research programs. For the first time, the Defense Dept. has named a deputy director of defense research for engineering and chemistry. He is James H. Gardner of Wayland, Mass., a chemist by training and vice-president of National Research Corp.



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- ALFOL straight-chain primary alcohols for anionic, cationic and nonionic surfactants

for the plastics industry...

- secondary plasticizers
- plastisol viscosity depressant, pigment dispersant and vinyl foam additive
- cyclohexane
- ALFOL straight-chain primary alcohols for manufacturing superior ester plasticizers and mercaptan polymerization regulators

for the lubricating oil industry...

- synthetic oil-soluble sulfonates for lubricating oil and industrial oil compounders
- straight-chain primary alcohols for ester-type V.I. improvers and oxidation inhibitors

The information presented here is believed to be accurate and reliable. However, no warranty is made or intended. Further, nothing contained herein should be construed as a suggestion to infringe any patented invention.

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CONOCO PETROCHEMICALS FOR THE DETERGENT INDUSTRY

NEOLENE® 400 intermediate is the alkylbenzene chosen by the world's leading manufacturers of liquid and dry anionic detergents for optimum performance in both hard and soft waters. With an apparent molecular weight of 240, this branch-chain alkylate gives the most satisfactory balance of the factors important in the finished product: high detergency, rinseability, wetting and low hygroscopicity.

NEOLENE 400
TYPICAL PHYSICAL PROPERTIES

Specific Gravity at 60°F	0.8690
Apparent Molecular Weight	240
Bromine Number	0.10
Aniline Point	48.5°F
Refractive Index at 68°F	1.4885
Flash Point (C.O.C.)	260°F
Appearance	Water White
Boiling Range	535—603°F

CONOCO DBCL® intermediate reacts with tertiary amines to form cationic surface-active agents called quaternary ammonium salts. Quaternaries are used as the active ingredients in sanitizer preparations, as textile softeners and as antistatic agents for fibers, plastics and paper.

CONOCO DBCL
TYPICAL PHYSICAL PROPERTIES

Specific Gravity at 60°F	0.965
Apparent Molecular Weight	292
Activity	Approx. 95%
Minimum Activity	93%
Flash Point (C.O.C.)	355°F
Viscosity S.U.S. at 100°F	105
Pour Point	Less than —5°C

Other Alkylaryl Type Detergent Intermediates Include:

CONOCO Sulfonic Acids — **Sodium Toluene Sulfonate (Liquid, 40% active)**
CONOCO C-50 Slurry — **Sodium Xylene Sulfonate (Liquid, 40% active)**

ALFOL® alcohols are a homologous series of straight-chain alcohols containing even numbers of carbon atoms. Their molecular weight range includes 1-hexanol (ALFOL 6) up through 1-eicosanol (ALFOL 20). For a good many years, alcohols of this type have been known as fatty alcohols because of their derivation from natural fatty acid sources... such as coconut oil and tallow. Conoco's research and development program over the past six years has pioneered their synthetic production from petroleum. For the first time, these alcohols are available from a stable raw material source (ethylene) and are very economical replacements for naturally-derived alcohols. ALFOL alcohols are commercially available as relatively pure (95-98%) individual alcohols and as mixtures of two or more components.

In the detergent industry and for industrial uses where products with good cleaning and/or wetting properties are required, the alcohols of about the C_{10} or C_{12} through C_{18} molecular weight range may be converted to several types of derivatives. Derivatives of straight-chain primary alcohols of the ALFOL type have several distinct advantages over those made from branch-chain primary alcohols or alkyl phenols.

Examples of typical fatty alcohol derivatives appear in the chart below.

ANIONIC DETERGENT DERIVATIVES

$CH_3\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}O\text{-}SO_3^- Na^+$
SODIUM LAURYL ALCOHOL SULFATE

$CH_3\text{-}CH_2\text{-}(CH_2\text{-}CH_2)_4\text{-}CH_2\text{-}CH_2\text{-}O\text{-}CH_2\text{-}CH_2\text{-}(O\text{-}CH_2\text{-}CH_2)_2\text{-}O\text{-}SO_3^- Na^+$
SODIUM LAURYL ETHER SULFATE

CATIONIC DERIVATIVE

$CH_3\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}CH_2\text{-}N^+(CH_3)_2\text{-}CH_3\ Cl^-$
LAURYL TRIMETHYL AMMONIUM CHLORIDE

NONIONIC DERIVATIVE

$CH_3\text{-}CH_2\text{-}(CH_2\text{-}CH_2)_4\text{-}CH_2\text{-}CH_2\text{-}O\text{-}CH_2\text{-}CH_2\text{-}(O\text{-}CH_2\text{-}CH_2)_6\text{-}O\text{-}CH_2\text{-}CH_2\text{-}OH$
ETHOXYLATED LAURYL ALCOHOL

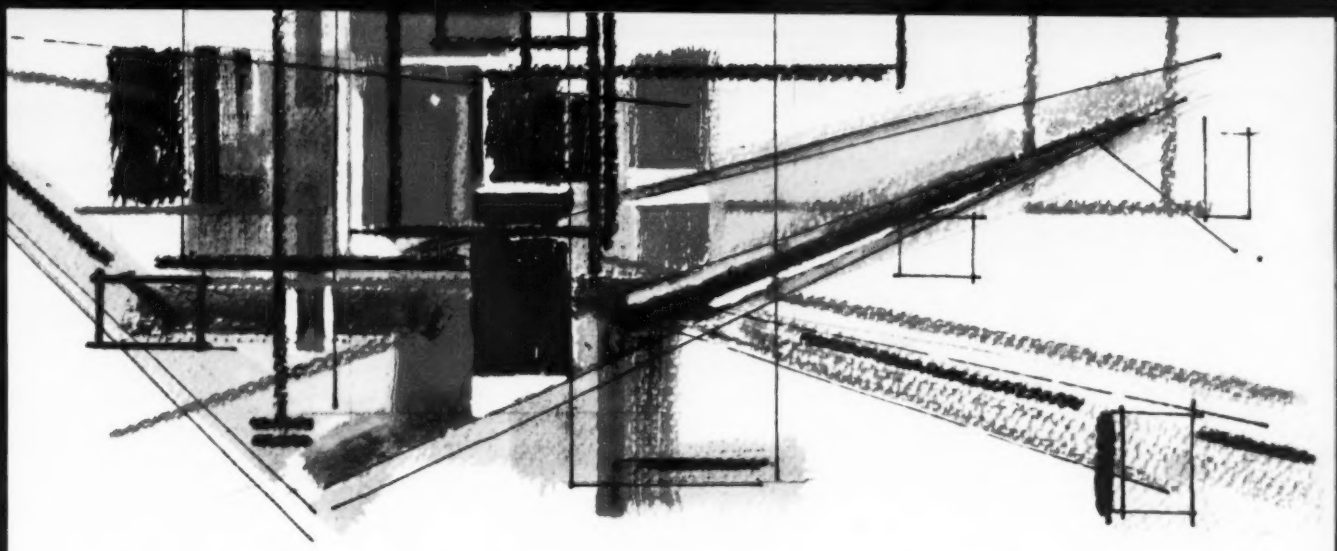
The first material shown on the left is sodium lauryl alcohol sulfate. The same compound results if ALFOL 12 is used instead of the coconut oil derived lauryl alcohol. It is an example of anionic type surface-active compounds made by sulfation of the alcohols, followed by neutralization to form a metallic, ammonium or amine salt. These alcohol sulfates have excellent surface-active properties which vary from the lower to higher molecular weight ends of the series. For example, the C_{12} derivative has good detersive and excellent foaming and wetting properties. Because its calcium and magnesium salts are quite soluble, this C_{12} derivative is unusually stable and effective in hard water. The C_{14} alcohol sulfate appears to be superior in detergent action to the C_{12} as judged by certain tests. Its foam stability and character are also excellent. The C_{16} and C_{18} alcohol sulfates are better detergents for cotton, but are not as good foam producers as the C_{12} and C_{14} alcohol sulfates.

Sodium lauryl ether sulfate is another example of an anionic type active ingredient for detergent formulations. This type material is made from an alcohol and ethylene oxide followed by sulfation and neutralization. The alcohol ether sulfate compounds are exceptionally water-soluble and are gaining interest as detergents with good foaming properties. Because of these and other advantageous characteristics, they are finding application in liquid detergent formulations.

Lauryl trimethyl ammonium chloride shown in the chart is an example of the cationic class. The cationics—also called quaternary ammonium compounds—will kill many types of bacteria. They are therefore used in many sanitizer formulations—even in oil wells to kill certain bacteria which cause plugging of the formation and corrosion of equipment.

Still another class of surface-active materials derived from ALFOL alcohols is illustrated by the ethyoxylated lauryl alcohol shown in the chart. This is representative of the nonionic type surface-active materials. The nonionics are particularly good emulsifiers for oil and water. The water-soluble (oxygen containing) end of the molecule can be sized relative to the oil-soluble end to yield a wide variety of products with different properties, as desired. These materials are used in household products and in many industrial applications...for example, wetting agents, textile processing chemicals, raw wool scouring, demulsifiers for crude oil and many others. Many are compatible with either anionics or cationics and can be used in formulations including one or the other of those types.

For further information concerning any Conoco detergent intermediate, please address your inquiry to Manager, Detergent Sales at the New York address listed on the front cover.



CONOCO PETROCHEMICALS FOR THE PLASTICS INDUSTRY

CONOCO H-35® secondary plasticizer is truly the "extender of profit" for vinyl formulators. Virtually colorless, its unique properties help achieve end products of highest quality. It is the most compatible of our secondaries for a wide range of formulations and gives improved viscosity control in plastisols.

TYPICAL PHYSICAL PROPERTIES

Color	Water White, Slightly Fluorescent
Specific Gravity at 100°F	0.8639
Molecular Weight	278
Viscosity S.U.S. at 100°F	85
Flash Point (C.O.C.)	315°F

CONOCO H-300® secondary plasticizer has long been recognized as a leader in the field of secondaries. Significant economies result from substantial replacement of primary plasticizers in most formulations.

TYPICAL PHYSICAL PROPERTIES

Color	Slightly Off Water White
Specific Gravity at 100°F	0.8639
Molecular Weight	300
Viscosity S.U.S. at 100°F	102
Flash Point (C.O.C.)	305°F

DEMIVIS® additive is a synthetic calcium sulfonate in a medium having plasticizing properties. It is an amber colored, homogeneous liquid having a specific gravity of approximately 0.937 at 60°F. DEMIVIS has important new applications in each of the following areas:

- As an extremely effective plastisol viscosity depressant
- As a pigment dispersant in plastisols
- As a time saver in premixing operations
- In vinyl foam production...used with blowing agents to produce finer, more uniform cell structure

---

CONOCO CYCLOHEXANE is commercially available in purities exceeding 99%. It is used as a starting material in the manufacture of nylon intermediates, such as caprolactum, cyclohexanone and adipic acid. Other applications include its use as a solvent and as a diluent in the manufacture of polyethylene by the low pressure process.

ALFOL 6, ALFOL 8 AND ALFOL 10 normal primary alcohols can be esterified individually or in mixtures to give plasticizers with many advantageous characteristics. Many millions of pounds of C_6 (hexyl), C_8 (octyl) and C_{10} (decyl) alcohols of both straight and branch-chain types are used to make plasticizers principally for polyvinyl chloride plastics. Variations in ester-type plasticizers can be obtained by changing either the alcohol or the acid portion of the ester. For example, the acid portion may be phthalic or maleic anhydride or dibasic acids such as adipic or sebacic. The branched-chain alcohols commonly used are 2-ethyl hexanol from the aldol process and mixed isomers of C_8 and C_{10} primary alcohols from the Oxo process.

Phthalate esters of straight-chain primary alcohols have several well established advantages over competitive branch-chain materials. (1) They are less volatile. This means that they impart more permanent plasticity to PVC products. (2) They impart better low temperature flexibility. ALFOL alcohol derivatives perform better at both the high and end and the low end of the temperature scale. (3) They reduce plastisol viscosities. This makes plastisol formulations easier to handle both immediately after mixing and when aged.

Some of these improved properties were obtainable only from higher cost plasticizers, before the commercial development of the ALFOL alcohols. For example, polymer types give low volatility, and adipate and sebacate esters are superior to branch-chain DOP in low temperature flexibility.

Straight-chain alcohols are of interest also for other uses in the vinyl plastics industry. Esters of epoxidized fatty acids are gaining acceptance as non-metallic stabilizers. Maleate, acrylate and other unsaturated esters can be co-polymerized with vinyl acetate and other economical monomers to produce internally plasticized resins for paints and other products. The availability of straight-chain alcohols offer stabilizer and co-monomer producers the opportunity to achieve superior properties such as those which are well known in phthalate plasticizers.

Straight-chain dodecyl mercaptan an ALFOL alcohol derivative, is a valuable polymerization regulator used by rubber and plastic manufacturers. Controlling molecular weight in styrene-butadiene synthetic rubber is crucial. Too heavy a polymer cannot be worked easily in subsequent steps; material of too low molecular weight cannot absorb the proper amount of low cost extender oil.

For further information about any Conoco plastic intermediate, please address your inquiry to Manager, Plastic Intermediates Sales at the New York address listed on the front cover.

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Bryton Chemical Company offers the world's most diversified series of oil-soluble sulfonates. Included in Bryton's full line are sodium, barium, calcium, ammonium and magnesium salts and sulfonic acids. The sulfonates are manufactured to give a wide choice of active concentrations and in base numbers *ranging up to 300!*

Years of research and development culminated recently in the commercial production of two 300 base number sulfonates...HYBASE® M-300 magnesium sulfonate and HYBASE C-300 calcium sulfonate. New salts are currently being investigated. These products represent a significant development for oil compounders who face the problem of introducing a high level of metal into their additive formulations to achieve outstanding "reserve alkalinity" action in finished oil blends. HYBASE M-300 is presently used in marine diesel cylinder lubricants for drastic reduction in wear when high-sulfur fuels are used. It is also an effective fuel additive in combating the harmful effects of vanadium contained in many economy fuels.

Sodium salts are generally offered at 62% concentration in mineral oil and are prepared at different molecular weight levels within the range of 430 to 500+. Choice for a given application is dependent on the required balance of hydrophylic versis hydrophobic characteristics. Usually, the lower the molecular weight the more hydrophilic, and the higher, the more hydrophobic. If the application is emulsification, lower or middle-range molecular weight products are best suited. For rust preventives and oil-system dispersancy, the higher molecular weights are preferable.

Calcium and barium sulfonates are primarily hydrophobic and are offered as either neutral or alkaline.

BRYTON® Ammonium Sulfonate 35-K is prepared as a 35% solution in kerosene, and is of interest to those seeking an ashless sulfonate.

BRYTON 76 is the only water-soluble sulfonate offered. It is 38% active diluted in isopropanol and water.

Sulfonic acids are available in two grades for those manufacturers who desire an intermediate.

A new line of synthetic fatty alcohols is now available to the lubricating oil industry. Trade-named ALFOL, this series of straight-chain primary alcohols with even numbers of carbon atoms from six through eighteen will relieve many products from dependence on fat and oil-derived materials. For example, in lubricating oils, poly-methacrylate ester type viscosity index improves and pour point depressants are well known. ALFOL alcohols can also be used in oxidation inhibitors of the zinc dithiophosphate type. Straight-chain alcohols provide esters with maximum compatibility for a given molecular weight as well as a high degree of stability.

BRYTON CHEMICAL COMPANY
1270 Sixth Avenue, New York, 20, N. Y.

Typical Analyses—BRYTON COMMERCIAL SULFONATES AND SULFONIC ACIDS

		MOLECULAR WEIGHT (1)	SULFONATE WT. % ACTIVE	WT. % OIL	WT. % WATER	WT. % INORGANIC SALT	ALKALINITY (2)
SODIUM SULFONATES	BRYTON 430 (3)	430	62	32.7	4.5	0.7	0.1
	BRYTON 445 (3)	445	62	32.7	4.5	0.7	0.1
	BRYTON F (3)	465	62	32.7	4.5	0.7	0.1
	BRYTON T (3)	500+	62	32.7	4.5	0.7	0.1
	BRYTON HY	470	62	33.8	3.5	0.7	0.04
	BRYTON BOSS 470	470	70	17.2	12.0	0.8	0.04
	BRYTON H-70	460	70	25.5	4.0	0.5	0.04
	*BRYTON 76	400	38	3.0	32.0	2.0	—
BARIUM SULFONATES	HYBASE Barium Sulfonate	1010	47	42	0.4	—	65 (Base No.)
	Barium Sulfonate 30-N	1010	30	68.4	0.2	—	8 (Base No.)
CALCIUM SULFONATES	Calcium Sulfonate 30-A	900	30	69.0	0.2	—	15 (Base No.)
	Calcium Sulfonate 45	900	45	53.3	0.2	—	21 (Base No.)
	HYBASE C-300	940	30	43.5	0.5	—	300 (Base No.)
MAGNESIUM SULFONATE	HYBASE M-300	920	30	47	0.5	—	300 (Base No.)
ASHLESS SULFONATE	Ammonium Sulfonate 35-K	455	35	64**	1.0	Nil	Trace
						% SULFURIC ACID	
SULFONIC ACIDS	Sulfonic Acid 45	440	45	46	3.0	6.0	—
	Sulfonic Acid 45-K	440	45	49**	3.0	3.0	—

(1) Pertains to the sulfonate portion of the products.
(2) Expressed as percent Na_2CO_3 for natural sulfonates and percent NaOH for synthetic sulfonates.
(3) Natural sulfonates. All other products are synthetic sulfonates. *In Isopropanol, 25% by weight. **Kerosene.

Forging Antiradiation Armor

In the face of rising public interest in antiradiation drugs, the Army recently put the "classified" stamp on much information relating to research in this field. This move—not yet followed by the Air Force and Atomic Energy Commission (which also sponsor such work)—hints that major progress in antiradiation armor is in the offing.

The search for potent protective compounds has had to proceed on a broad, empirical basis. Reason: there is yet no definite understanding of how protective agents—i.e., drugs administered before exposure to radiation—work.

Many Uses: Although resumed testing of nuclear devices is clearly behind much of the popular interest in this field, medical interest is closely tied to diagnostic and therapeutic uses of radiation.

Main goal is an orally administerable compound that is highly effective in preventing radiation damage, lacks side effects and maintains its effectiveness over a long period. Many compounds—notably the sulfhydryls (*CW, Oct. 19, '57, p. 69*)—have been found that satisfy some of these qualifications but none has yet combined all the desired qualities. Added problem: most of the effective drugs are prophylactic only—are totally useless when administered as soon as 30 seconds after the test animal is exposed to radiation. (A postexposure treatment is the goal of a number of projects.)

Most success has been achieved in protection against gamma rays and the somewhat similar X rays. Chemical protection against alpha particles and neutrons appears to be much weaker, but physical shields are feasible in these cases.

While concentrating on improving

CW PHOTO—SYD HARRIS

USAF Radiation Lab's Doull and assistant check irradiated mouse.

survival percentages of the test animals themselves, researchers have also made some studies of the descendants of chemically protected test animals. So far, there are indications that the chemicals provide some protection against genetic effects; at least protection was afforded to the descendants of some test microorganisms.

Shotgun Approach: The scarcity of clear guide-posts has forced workers to adopt a broad view of the type of compounds that are potentially effective drugs. Of over 2,000 compounds known to have been tested to date, about a dozen have shown strong radioprotective activity, and more than 100 have shown slight to moderate effect.

Chemical classes represented among the active drugs include sulfhydryl compounds and precursors (especially mercaptoethylamine, aminoethylisothiourea—MEA and AET, respectively—and their derivatives); nitriles; chelating agents (e.g., thiocarbamates); "biological" amines (e.g., histamine, serotonin); certain hydroxyl compounds (e.g., glycerol, ethanol, fructose); and substances that lower the oxygen level in the blood (e.g., *p*-aminopropiophenone—PAPP).

At the University of Chicago's U.S. Air Force Radiation Laboratory, which has tested more than 1,200 compounds, work is being focused on the most fruitful chemical classes, but the survey or nondirective type of compound selection has not been abandoned. In addition to searching for more-effective agents, the Air Force hopes to find compounds that protect against a wider range of radiation (especially neutrons) and that are effective when administered after exposure.

Assistant director of the laboratory, John Doull, tells *CW* that toxicity is the major factor limiting clinical testing of the now available drugs, since nearly all of them have to be given at toxic or near-toxic doses to be effective. And these compounds are not very effective, compared with standard antidotes for other lethal agents.

Army Activity: Despite its current secrecy, the Army is known to be deep in the search for antiradiation drugs, principally through the Walter Reed Army Institute of Research (Washington, D.C.) and a fairly large number of outside contractors (which perform about 60% of the Army's work in this area). Latest published Army studies were all concerned with sulfhydryl compounds, although more recent work has been labeled "classified."

The Army has screened about 500 drugs in mice, and about 1,200 in bacteria. A combination that allowed 23 dogs to survive a lethal dose of radiation consists of PAPP and *p*-hydroxydiphenyl, injected an hour before exposure, and larger amounts of MEA and cysteine, injected immediately before exposure.

Side effects are considerable, but the level at which the drugs become lethal themselves is nonetheless below that at which they afford radiation protection. Walter Reed's David Jacobus and Major Michael Dacquisto point out, however, that the severity of impending radiation exposure has a direct bearing on the amount of drug toxicity that will be risked.

AEC Role: The Atomic Energy Commission's Biology and Medicine Division is also concerned with antiradiation drug research, and it too contracts out many of its studies. Principal focus is on derivatives of AET, activity of which was discovered by David Doherty and his co-workers at Oak Ridge National Laboratory. AET has been so widely studied that Abbott Laboratories (North Chicago, Ill.) has been supplying it commercially for several years. AEC's interest in AET is enhanced by its dual role as both a sulfhydryl precursor and a chelating agent.

Other AEC interests include basic studies of radioprotective mechanisms and development of postirradiation therapeutic treatments (e.g., bone marrow grafting and administration of chelating agents such as ethylenediamine tetraacetic acid—EDTA—to remove radioactive isotopes from the body).

After Exposure: Although no postirradiation drug has been found to lessen the effects of a lethal dose of radiation, a few treatments have been found useful in cases where the radiation has not had time to take full effect. In addition to the AEC work, the Navy is concentrating its research on postirradiation treatments. And Parke, Davis & Co. (Detroit) recently started a long-range program aimed at palliatives for radiation damage to the body.

A new chelating agent to remove radioactive strontium from the body has reportedly been found in Germany. Alexander Catsch, deputy director of the Institute of Radiation Biology (Karlsruhe), believes that early treatment with a strontium-sodium compound of diaminodiethyl ether tetraperacetic acid could remove at least 90% of the radioactive strontium from the body. Plutonium removal has already been accomplished in a similar way, but strontium-90, a bone-seeking fallout product with a long half-life, has been a major problem to researchers. Cesium-137, a long-life fallout isotope that affects the whole body, is a key target of AEC therapeutic research.

Mechanism Roadblock: Although chemicals' ability to provide radioprotection has been known for over 10 years (it was discovered independently in '49 at Chicago and Liège (Belgium) universities, the means by which they do this is still a mystery. And, as the breadth of research programs indicates, researchers are thus severely hampered in tailoring useful compounds.

The structural similarity of the first active compounds (which contained thiol and amino groups separated by two or three carbon atoms) led early investigators to assume that the fundamental biological effect of radiation in all living systems was the blocking of certain thiol-containing enzyme systems. However, other classes of active compounds were discovered, and others closely related to the original ones were found to be inactive.

As a result of these mixed findings, Liège's Z. M. Bacq has been led to observe, "What in '52-'53 appeared to be a set of clear and simple facts and theories has today become so complicated that it is difficult to disentangle the intricate mass of detail. Even well-meaning specialists may be led astray through inability to grasp the true significance of the arguments in the various fields of physical chemistry, physiology, biochemistry, pathology and radiobiology."

Currently three general hypotheses (and combinations of them) are being expounded to explain the action of chemical radioprotection. The agent (1) lowers the animal's oxygen levels (radiation is more harmful in the presence of oxygen); (2) reacts with —and thus chemically protects—radiation-sensitive thiol and disulfide

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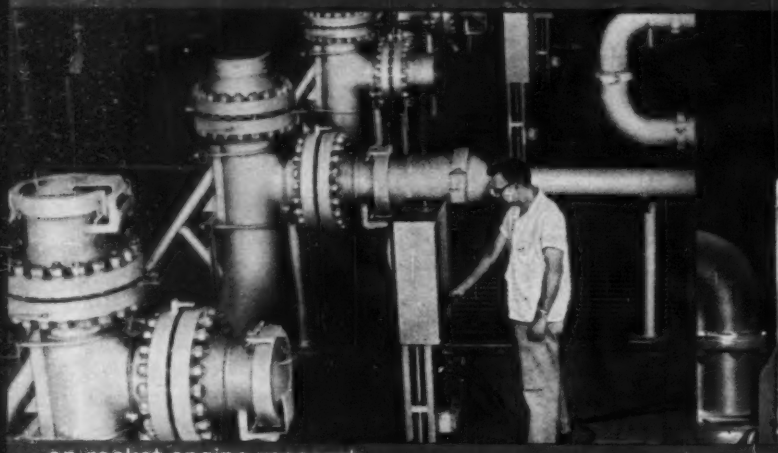

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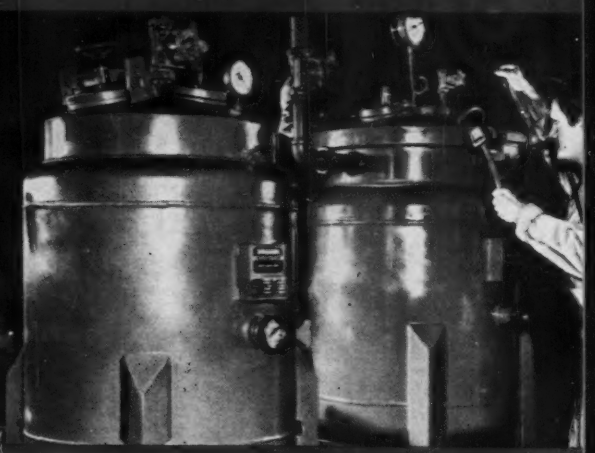

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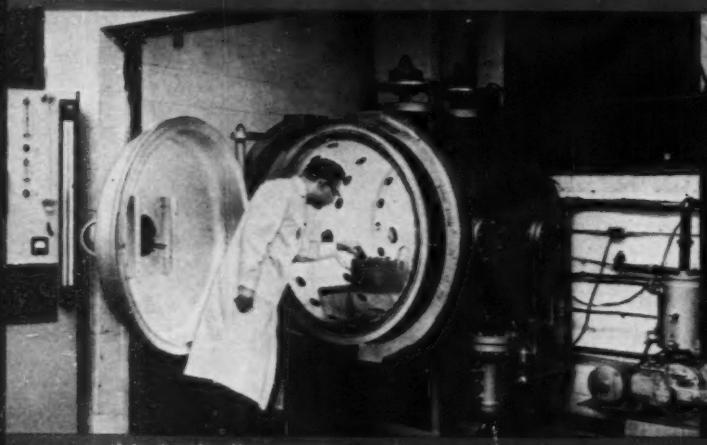

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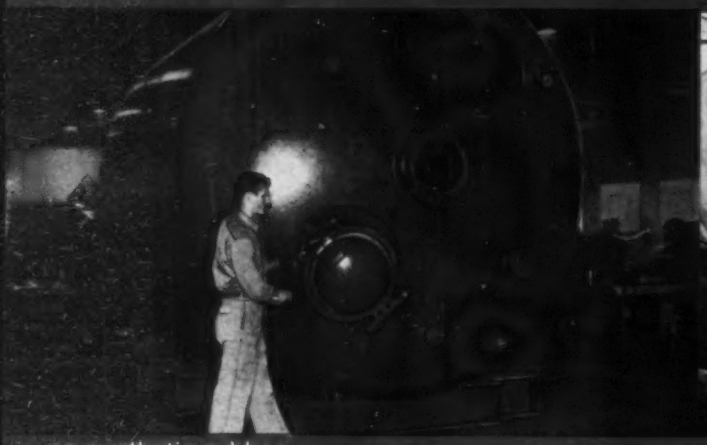

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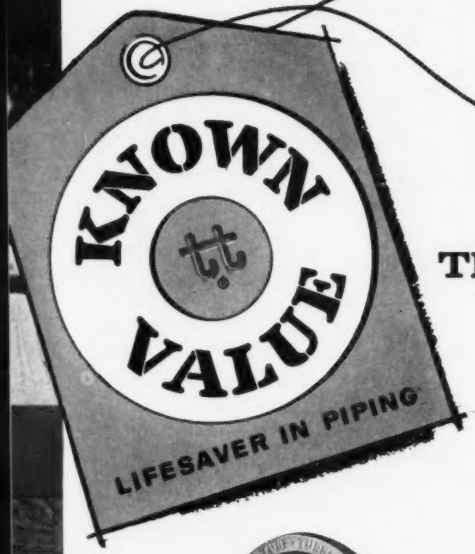

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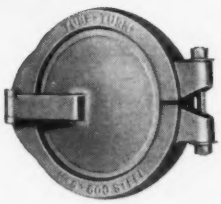

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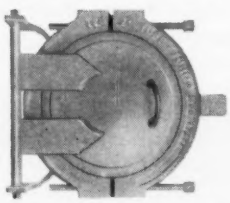

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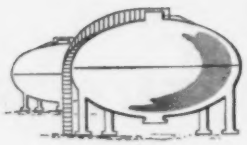

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groups; (3) traps free radicals that could serve as intermediates in destroying biological systems.

Although the theories do not explain the action of all known antiradiation drugs, they do aid in selecting new compounds for testing.

Still in the early stages, work toward useful antiradiation drugs shows definite signs of progress. But lack of understanding of protective mechanism in delaying the much-needed breakthrough in this critical area of drug research.

Basic Studies Upswing

Basic research in industry is growing, but companies differ on how soon to publish results, according to a newly completed National Science Foundation survey.

NSF this week reported the basic research expenditures and policies of 174 companies in "Publication of Basic Research Findings in Industrial Firms, 1957-59." The number of basic research papers published by the companies grew from 2,290 in '57 to 2,700 in '58 and 3,310 in '59 (45% above the '57 total). Of the 174 firms, eight spent more than $5 million on basic research in '59 and published 1,450 papers that year (44% of the total by all 174 companies).

Citing the difference in publication policies among companies, NSF Director Alan Waterman noted that firms with liberal publication policies gave prestige, easier recruiting and improved staff morale as their main reasons for their plans. Companies more reluctant to publish results cited competitive reasons—e.g., unwillingness to release basic research data to rivals.

EXPANSION

• A new cryogenics laboratory in which materials can be tested at temperatures approaching absolute zero has been put into full operation at Rocketdyne, a division of North American Aviation, Inc. (Canoga Park, Calif.). The laboratory is equipped to test mechanical and physical properties of materials in liquid hydrogen.

• The National Aeronautics and Space Administration is consolidating its nuclear-electric propulsion program (*CW, Sept. 9, p. 105*) at NASA's

Photo by Fabian Bachrach

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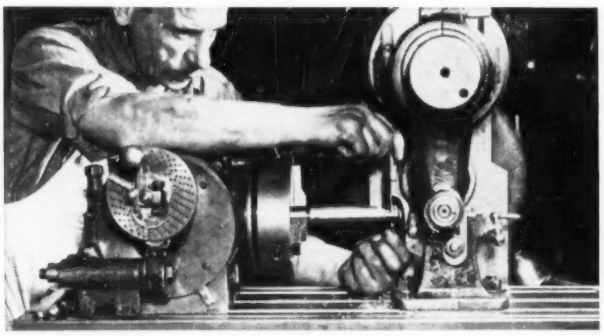

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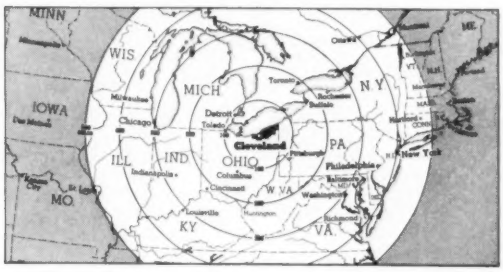

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Lewis Research Center (Cleveland). Forty-eight industrial contracts are involved in the program. The transfer includes research work at Huntsville, Ala., but will not affect the RIFT (reactor-in-flight-test) program there for flight-testing nuclear rockets as upper stage of large chemical boosters.

• Cryovac Division of W. R. Grace & Co. (New York) is moving from Cambridge, Mass., to Spartanburg, S.C. Construction of new facilities, 50% of which will be for research and development, started this week. The move puts Cryovac headquarters closer to the division's major manufacturing plant at Simpsonville, S.C.

• Formation of a new company, International Research Corp., to specialize in research has been started by Cluett, Peabody International and a Swiss company, Heberlein Holding AG. (Zurich). Facilities will be near Zurich.

• Sun Chemical Corp. (New York) opened its new corporate laboratory for long-range research in synthetic organic chemistry at Carlstadt, N.J.

• The Army Corps of Engineers, handling construction for the Arnold Engineering Development Center (Tullahoma, Tenn.), has asked for bids on construction of a $17.5-million Mark I aerospace environmental test chamber. Bids are to be opened Jan. 18, '62. The unit will have a 10-story building—three floors below ground level—and a stainless steel test chamber 35 ft. in diameter and 30 ft. high.

• The first building of its new, $30-million Space Technology Center at Redondo Beach, Calif. was opened by Space Technology Laboratories, Inc., a subsidiary of Thompson Ramo Wooldridge Inc.

• The University of Idaho and the U.S. Forest Service are cooperating to set up a new, $285,000 forest research center and laboratory on the university campus (Moscow, Ida.). The new unit will include laboratories for pathology, biochemistry, physiology, genetics and soils studies. Construction start: spring of '62.

• AeroChem Research Laboratories, Inc., a subsidiary of Pfaudler Permutit Inc., has just broken ground for a new laboratory at Monmouth Junction, N.J. The 10,000-sq.ft. additional floor space will double the firm's laboratory area.

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Gas 0°C, 1 atmos . . . 1.74
BOILING POINT °C, 760 mm . . . —23.76
°F, 760 mm . . . —10.76
REFRACTIVE INDEX, n 20°/D
Liquid—23.7°C . . . 1.3712
Gas 25°C . . . 1.000703
SOLUBILITY (in cc.) of Methyl Chloride Gas In 100 cc. of solvent (20°C, 760 mm)
Water . . . 303
Benzene . . . 4723
Carbon Tetrachloride . . . 3756
Glacial Acetic Acid . . . 3679
Ethanol . . . 3740

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RESEARCH

PRODUCTS

Beryllium Forms: Nuclear Metals, Inc. (Concord, Mass.), is now producing single cystals of beryllium (by the floating-zone melting technique) and vacuum-distilled "ultrahigh-purity" beryllium.

•

Ammonium Molybdates: Sylvania's Chemical, and Metallurgical Division (Towanda, Pa.) now offers two ammonium molybdates: ammonium paramolybdate and the polymolybdate. Both products can be used to prepare high-purity molybdenum powder and metal.

•

Strontium Fluoride: Semi-Elements, Inc. (Saxonburg, Pa.), is turning out a new laser material, single crystals of strontium fluoride doped with samarium in the divalent state. A series of strontium fluoride crystals will be grown with various dopings; the next in the series will be neodymium in the fluoride.

•

Ruby-Sapphire Combination: Composite crystals with a synthetic ruby core and a synthetic sapphire sheath are now being grown on a production basis by Linde Co. (New York), division of Union Carbide Corp. The crystal configuration was devised by two Bell Laboratories scientists, G. E. Devlin and A. L. Schawlow. The new synthetic ruby overlay boules, the latest addition to a line of special maser-quality ruby crystals, states Linde, have the lowest pumping energy threshold ever produced in ruby.

CONTRACTS

• A $1,758,000 supplemental fund for continued research and development of a cesium-powered ion rocket engine has been awarded by the National Aeronautics and Space Administration's Marshall Space Flight Center (Huntsville, Ala.) to Hughes Research Laboratories Division of Hughes Aircraft (Malibu, Calif.). The increase brings Hughes' existing contract value to $2,657,000.

• New methods of separating mixtures of chemical compounds will be investigated for the Army by Ionics, Inc. (Cambridge, Mass.). The $30,500 contract calls for study of membrane permeation. Ionics' proprietary process, which involves the use of selec-

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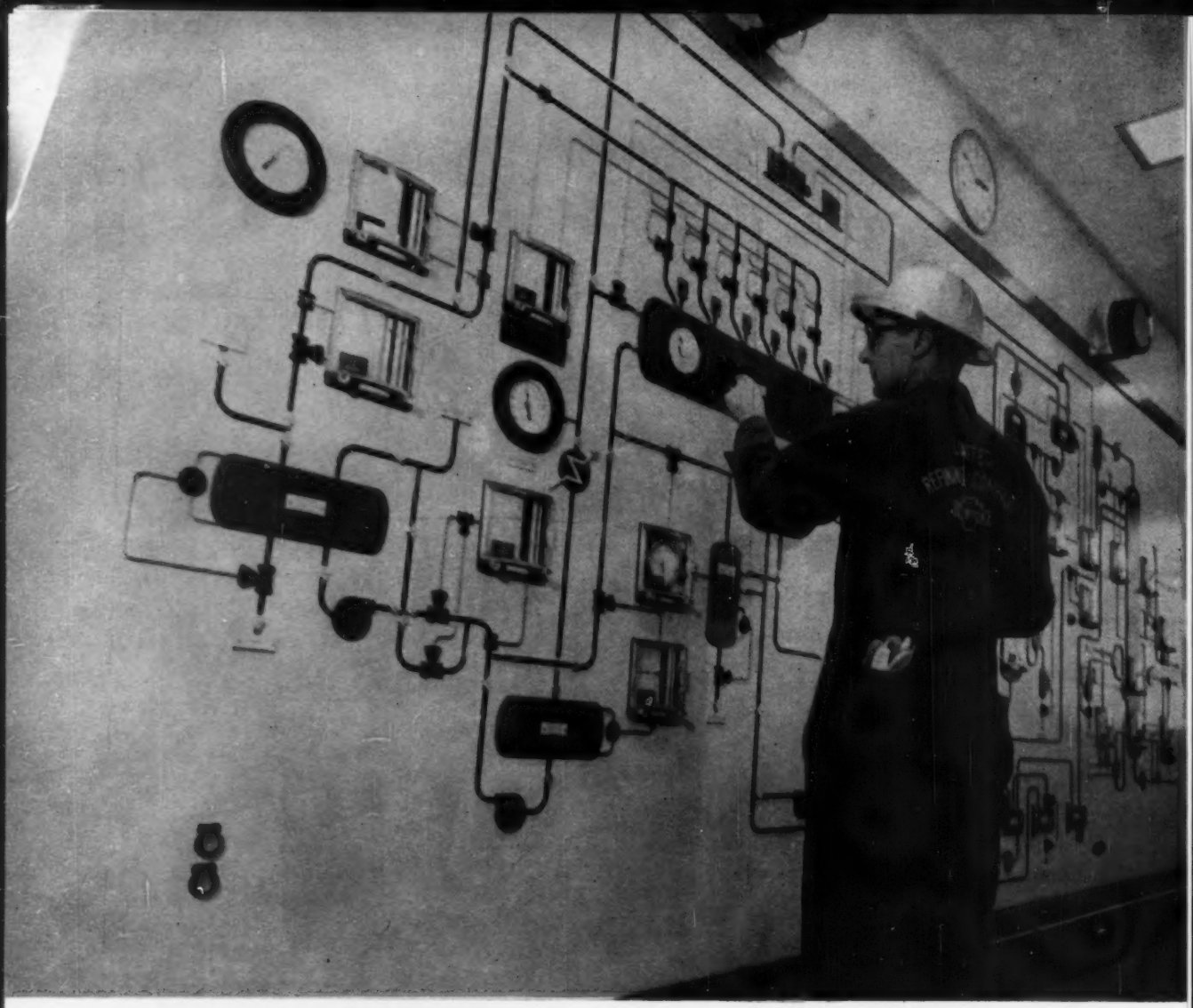


Graphic Measurement and Control Panel on United Refining's new Alkylation Plant at Warren, Pa. (1100 bbl. per day mixed feed at 7 RVP).

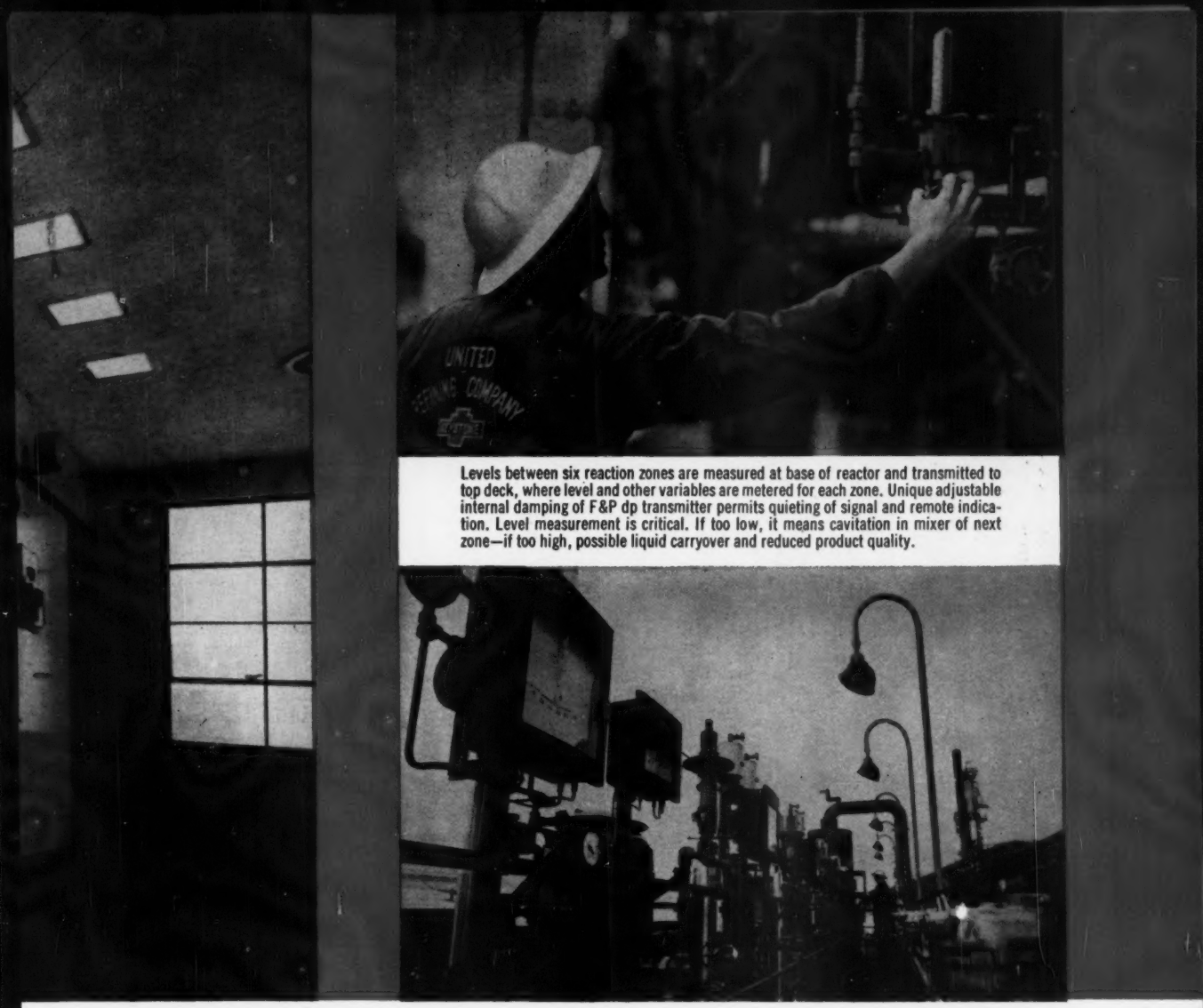
Key process variables take their orders from F&P controls

United Refining's new Alkylation Unit puts F&P's system capabilities to work.

On stream since late 1960, United Refining Company's new Alkylation Plant vividly demonstrates Fischer & Porter's capability for closing the process control loop. Here, F&P instruments measure and pneumatically control such variables as flow, pressure and level—either locally or from the Graphic Panel. Besides *supervising* the alkylation process directly and successfully, F&P controls have proved themselves accurate, easy to work with, simple to service.

Novel Use of Level Instrumentation Cuts Construction Costs

Something strange about the cascade reactor of United's new Alkylation Plant. No intermediate platform! How, without a catwalk, do operators read gauge glasses? They don't. Reactions and agitation in the vessel cause the level-measure-



Levels between six reaction zones are measured at base of reactor and transmitted to top deck, where level and other variables are metered for each zone. Unique adjustable internal damping of F&P dp transmitter permits quieting of signal and remote indication. Level measurement is critical. If too low, it means cavitation in mixer of next zone—if too high, possible liquid carryover and reduced product quality.

Unit design and construction: The M. W. Kellogg Company, New York, N.Y.
Instrumentation: Fischer & Porter, Warminster, Pa.

ment signal to flash and bubble—practically "bounce". But F&P dp transmitters damp this signal and shoot it to the top of the reactor—for checking with other variables. Saved: the cost of a catwalk and time spent in periodic gauge glass peeking.

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Instrument servicing can be a problem—under ordinary circumstances. But not at United Refining. Reason: Fischer & Porter conducted a special service school, right in Warren, for United's personnel. One more bit of evidence that Fischer & Porter leaves nothing to chance.

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The United story proves it. Now learn what it can do for you in your next control system—right on through from design to operation. For our over-all story in brief, write for a copy of Catalog 310. For a discussion of your specific process control problem, call your nearest F&P field engineer. Fischer & Porter Company, 2221 County Line Road, Warminster, Pa. In Canada: write Fischer & Porter (Canada) Ltd., 2808 Jane Street, Toronto.

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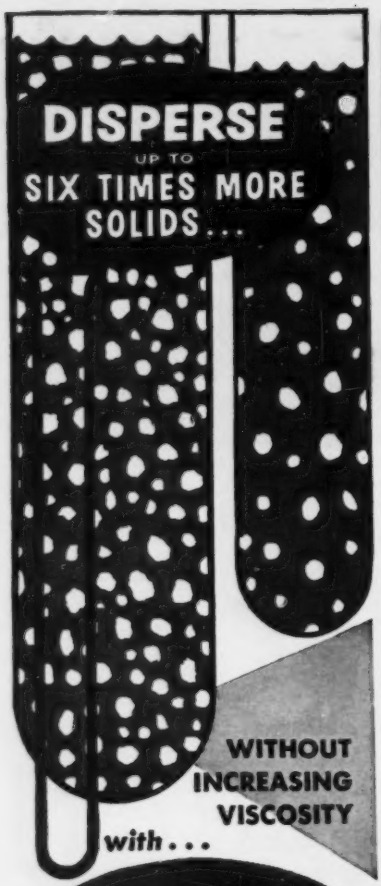

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RESEARCH

tively permeable plastic membranes, will be used.

• Optics Technology, Inc. (Belmont, Calif.), has received an Air Force contract for research and development of infrared crystalline fibers. The project will include work on methods of extending coated and uncoated crystalline fibers, methods of hot-drawing coated fibers and the fabrication of infrared fiber optics devices.

• A $34,800 contract to study the effect of surface coatings on the behavior of materials has been awarded by the U.S. Army Ordnance District (Philadelphia) to The Martin Co. (Baltimore, Md.).

LITERATURE

• "Specialized Science Information Services in the U.S." has been published by the National Science Foundation (Washington, D.C.).

• The U.S. Army's Picatinny Arsenal has published an 800-page volume, "Encyclopedia of Explosives and Related Items." Volume 1 (covering A to Azoxy) of the highly technical reference is now available from the Office of Technical Services, U.S. Dept. of Commerce, Washington, D.C. Volume 2 will be published within six months.

• Information for Industry, Inc. (Washington, D.C.) has completed the second phase of its "back package" program for its Uniterm patent index. These indexes now provide references to more than 100,000 U.S. patents related to chemical developments and issued from '50 through Aug. 31, '60. The second phase of indexing analyzes and cross-references 33,000 patents issued between '50 and '54.

• The U.S. Commerce Dept.'s Office of Technical Services offers a newly revised "Cryogenic Materials Data Handbook," compiled at the National Bureau of Standards. The 555-page book (PB 171,809) is priced at $7. Semiannual supplements ($4/year) will be issued to keep the material current.

• Pergamon Press Inc. (New York) has published "An Introduction to Coordination Chemistry," written by D. P. Graddon of the University of New South Wales. The 111-page book (price: $4) details the important advances in coordination chemistry over the past two decades.

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Paper, or cellulose, decomposes under high temperature—releasing flammable vapors which ignite. The flaming vapors generate more heat, and continue the decomposition of the cellulose. They "feed" the fire. To make paper flameproof, the Albemarle process upsets the normal release of the flammable vapors.

In one method of flameproofing, Albemarle saturates the paper with USS Ammonium Sulfate. A theory explaining how the process works is: under high temperatures the ammonium sulfate greatly accelerates the formation and release of flammable vapors. They are released so rapidly that sufficient oxygen is not available for their ignition.

Albemarle says ammonium sulfate is one of the most economic flameproofers for their process and they have found United States Steel to be one of the most dependable suppliers. If you want the same dependable service, specify chemicals from United States Steel.

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USS Chemicals

TRADEMARK

Technology
Newsletter

CHEMICAL WEEK
December 9, 1961

A French process for cross-linking polyolefins and carbon black will be exploited in the U. S. by The Welsbach Corp. (Philadelphia), which obtained exclusive sales rights last week. Societe Polyplastic (Paris) has been working on the ozone treatment of polymers to create active free-radical sites on the polymer chain. Dow Chemical has been licensed to use the technique in graft polymerizations *(CW, Jan. 28, p. 27)*. Polyplastic itself is now operating a pilot unit for cross-linking with carbon black. If operated full tilt, it could probably make 2-3 tons/day of product.

The process consists of passing a stream of air containing small quantities of ozone through a fluidized bed of polyethylene. (The process lends itself to either low- or high-pressure polyethylene or polypropylene.) The activated polymer is mixed with carbon black and the product is pelletized and extruded. Cross-linking takes place in the extruder.

The system permits high loading of polyethylene with carbon black (up to 50%) and reinforcement of some significant properties. For example, a product made up of 100 parts polyethylene and 50 parts carbon black shows—compared with polyethylene alone—an increase of 50% in tensile strength, 65% in burst strength and 20-30 C in softening point. Prime targets for the product: pipe, industrial molded articles, sheet for vacuum forming.

Hercules, Cabot and General Electric have done work on cross-linking of polyolefins with the aid of peroxides. Radiation is also being used, particularly in graft polymerizations.

•

Molecular sieves are taking on acidic jobs. Linde Co. (division of Union Carbide Corp.) last week introduced a new form, Type AW-500 Molecular Sieves, that shows no change in structure or loss of strength at pH's down to 2.5.

A mixed calcium and sodium aluminosilicate, the new adsorbent has a crystalline structure similar to that of the firm's existing line of molecular sieves. The new type is capable of adsorbing hydrogen chloride, sulfur dioxide and oxides of nitrogen.

Linde suggests the new material can be used in drying reformer hydrogen containing 25 ppm. hydrogen chloride, drying chlorine, purifying chlorinated and fluorinated hydrocarbons and purifying stack gases. The company says that several commercial installations for removing hydrogen chloride from hydrogen are now being built.

•

A solvent-free glycol is on the market. Eastman Chemical products (Kingsport, Tenn.) is now in commercial production of 1,4-cyclohex-

anedimethanol (CHDM) in solvent-free form. The compound was introduced as a 70% solution in methanol in '59, but Eastman says that customer preference was strongly for the solvent-free form.

The new CHDM is made by a high-pressure catalytic reduction of dimethyl terephthalate as a mixture of stereoisomers (approximately 70% trans, 30% cis). Price: 75¢/lb. in truckload drum lots, 76½¢/lb. in less than truckload drums. Potential applications: alkyds, unsaturated polyesters, plasticizers, polycarbonates and urethanes.

•

The American Institute of Chemical Engineers, meeting in New York this week (the 54th annual meeting), heard papers ranging far and wide in subject matter. Sample highlights:

• Theodore B. Selover, Jr., of Sohio's Research Dept. revealed work done with plasma jets in production of solid materials with unusual surface characteristics. He employed nickel carbonyl to prepare nickel fumes having much higher surface area than those prepared by conventional thermal decomposition. He reported that an argon plasma can be used to prepare metal oxide powder with "very interesting chemical and physical properties."

• Walter E. Lobo, consultant, compared costs of various methods of making acetylene from hydrocarbons, made a strong case for economics of the Wulff process. His study shows the Wulff process to offer the lowest acetylene cost at three plant capacities (20 million, 50 million and 100 million lbs./year). He pointed out, however, that the unit price for the ethane feedstock in his estimates is low "and probably unreasonably so, at the lower plant capacities." Also, he cautioned, the costs were intended to show a general picture rather than exact figures.

Significant, in view of Du Pont's decision to build a 50-million-lbs./year electric-arc acetylene plant near Montague, Mich., were Lobo's estimates on electric-arc processing. The Huls arc process showed higher costs than any other hydrocarbon-gas process considered. However, a hypothetical "improved arc" process, using methane, gave favorable costs, although not quite so low as the Wulff process.

• A team of researchers tagged fluidized calcination as a promising method of shrinking the volume of solutions containing fission products. A. A. Jonke and S. Lawroski of Argonne National Laboratories, B. S. Lee of Arthur D. Little, and Ju Chin Chu of Brooklyn Polytechnic Institute, said that the technique had achieved a volume reduction of six or eight to one. The volume now stored in underground tanks is of the order of 10 million gal. In the process, the material is atomized by a spray nozzle and injected into a bed of fluidized particles, where it's dried and calcined.

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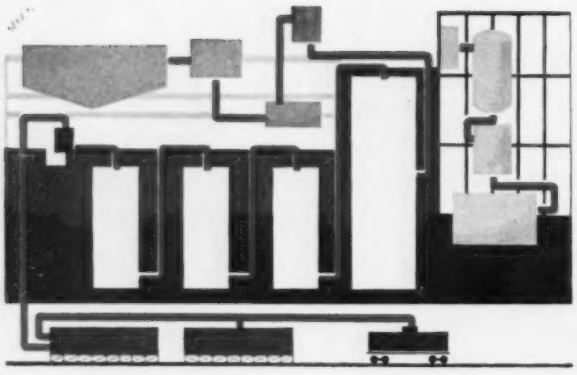
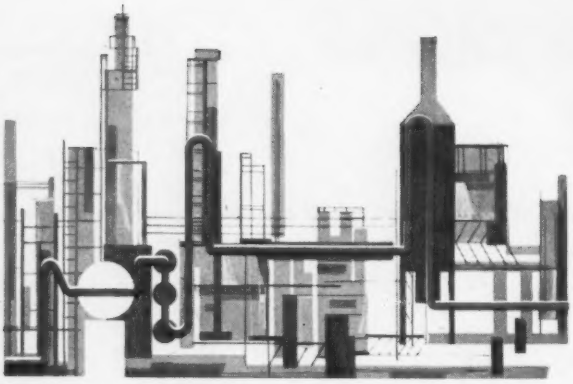


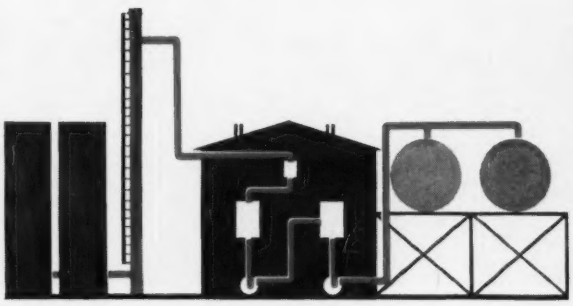
PROCESS-ABILITY IN GENERAL CHEMICALS *Typical of Blaw-Knox contributions here is the cooperation with a major producer of chlorine and caustic soda, in the development of a new type of Mercury cell design. This cell is being used in several operating plants designed and built by Blaw-Knox. Blaw-Knox has completed more than 100 process plants in the general chemicals field with a value in excess of 250 millions of dollars.*

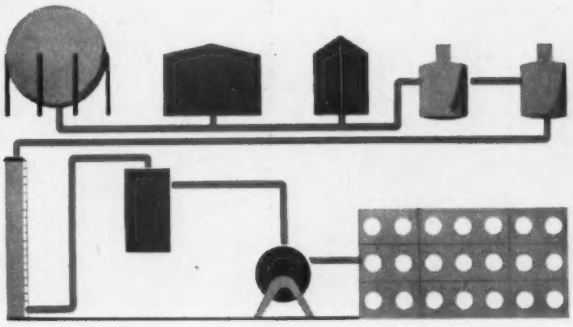


PROCESS-ABILITY IN PETROLEUM AND PETRO-CHEMICALS *Blaw-Knox has completed nearly 100 refining and processing plants in this broad field. Individual projects include all refining processes; production of petrochemical intermediates; production of monomers, fuel additives and plasticizers. Blaw-Knox offers many licensed processes which are made available by major oil and chemical firms both in the United States and abroad.*

IMPORTANT WORDS TO GROW WITH

Process-Ability describes the Blaw-Knox business-engineering service that develops your plan for process development, expansion or modernization. Bringing into a single focus all the factors that determine process feasibility, this important service can give you a clear picture of profitability *before* the investment of capital. ■ Blaw-Knox Process-Ability is the result of more than two decades' growth and refinement. Process-Ability can minimize research and development work; translate new or existing process data into commercial plant designs; apply the newest processing techniques, and give you realistic cost estimates *before* capital commitments. ■ Blaw-Knox Process-Ability is reflected in over four hundred completed processing facilities totalling more than eight hundred millions of dollars in corporate assets. It has resulted in the completion of process plants in such far-flung areas as Egypt and Australia, Holland and Mexico, Japan and England, Denmark and Brazil. ■ If you are considering expansion for profit, you will want to consider Blaw-Knox Process-Ability and its many unique contributions to the Processing Industries. A letter to Mr. C. F. Hauck, Vice President, will bring a full description of our services. Blaw-Knox Company, Chemical Plants Division, Blaw-Knox Building, Pittsburgh 22, Pa. District offices in New York, Chicago, Houston, Birmingham and San Francisco.





PROCESS-ABILITY IN FATS AND OILS *Blaw-Knox is perhaps best known in the fats and oils industry as the developer of the Rotocel Extractor used for the extraction of oils from oil seeds such as soybeans, cottonseed, corn germ and flaxseed. Installed capacity of Rotocels exceeds 2,500,000 tons-per-year of oil-bearing seeds. Total value of ninety-five Blaw-Knox installations in this field is in excess of 30 millions of dollars.*

PROCESS-ABILITY IN RESINS AND PLASTICS *Blaw-Knox experience in this field is represented by ninety completed plants valued at 150 millions of dollars. Early in World War II Blaw-Knox was chosen by the Defense Plant Corporation and the major rubber companies to design and build synthetic rubber plants. Since that time, Blaw-Knox has designed, engineered or constructed the majority of the free world's synthetic rubber plants.*

Chemical Plants Division

BLAW-KNOX

BLAW-KNOX

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These things are often greatly affected by the purity — or impurity — of the oleic acid in the product. Emersol 233 LL Oleic Acid has that rare *extra* measure of purity that helps lift products into the realm of acceptance and success. Unsurpassed light color and resistance to darkening. Extreme resistance to oxidation, which prevents deterioration and rancidity. The secret? Emery's careful, painstaking processing to reduce polyunsaturated acid content to yield an oleic acid of unmatched purity.

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Flatow's Flatow: Inventive approaches pave way for 10-fold growth.

Distributor with a Difference

The move to larger offices and new laboratories that specialty chemical distributor R. E. Flatow (Oakland, Calif.) is making this week is more than simple expansion. Primarily designed to give Flatow technical service backing for its selling efforts, the labs will also give the company business-boosting private formulation work, and help further its desired transition into specialties manufacture. And that's a pattern more distributors may have to follow.

Flatow's growth has been characterized by adaptability. It has made progress not only by being an agressive seller, but by quickly branching out into contract work and manufacturing—underscoring the limitations of a strictly distributive operation. It's not yet large—sales will hit about $1.5 million this year, and it has only 11 employees—but in its eight years of existence, it has increased sales tenfold.

Flatow serves as jobber or distributor for 15 U.S. and foreign companies. It now serves 11 Western states, Hawaii, Alaska, British Columbia and the Philippines, through a warehouse and sales office in Los Angeles, a warehouse in Seattle (to be followed by a full-time sales office in '62), and is planning manufacturing facilities for Oakland next year (when sales are expected to top $2 million).

Aggressiveness: But it has built this business by discarding much of the traditional role of manufacturers' representative, and by plunging after accounts that required it to provide technical service. It has even developed complete products where necessary to win over customers.

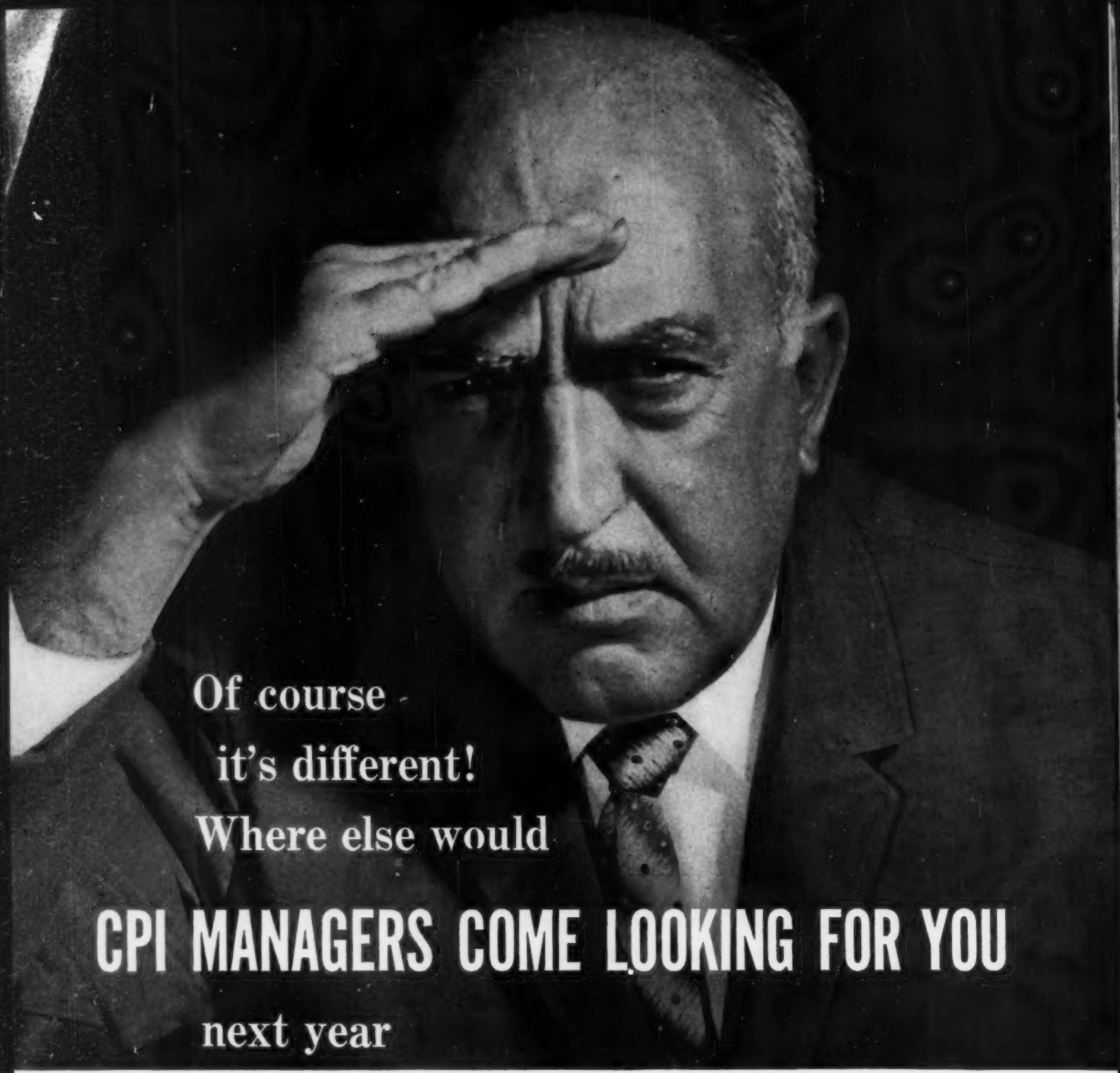
But, says Robert Flatow, a 38-year-old chemical engineer from University of Michigan, co-founder of the company and its present vice-president and secretary, its path hasn't been an easy one. Flatow claims it is impossible for any company to operate as a distributor and offer real service with the standard ("archaic" is his word) 5% commission that's been in effect since the 1920s. Because he wanted to give the kind of service his customers needed, Flatow had to move into jobbing chemicals and eventually into manufacturing.

As a jobber he buys the material outright and then does what he wants with it, including formulating, discounting, and setting price schedules —at a commensurate markup. Flatow believes this type of operation should be tried more often. His company jobs the fatty alcohols and derivatives of Dehydag (Dusseldorf, Germany), for example, and not only finds it profitable, but is helped by a visiting technical man that Dehydag puts at his disposal.

Change in Mind: At present Flatow's main interests are cosmetics, topical pharmaceuticals, floor polishes, inks and industrial application of waxes and emulsions. By stressing technical service, the company is trying to change its present income pattern—40% from services as a manufacturers' representative, 50% from jobbing, and 10% from sales of its own products—to a 25-50-25% breakdown.

Flatow's program will continue to be one of tailoring the products it distributes to fit the needs of its accounts. And to do this, Flatow has found it necessary to have its sales personnel technically trained and able to work right at the customer's lab or plant.

Most of the time this work is done on a no-fee basis and the formulation and aid is available for products the customer buys from the company. However, since the company has become so active in lab work, it has started a contract research sideline under the name Flatow Laboratories Division. Now, about 10% of



but right here?

That's right! Every seller knows getting prospects to come to him is a radical reversal of normal advertising strategy... in regular CPI media, you compete for the buyers' attention. Not so in Chemical Week's BUYERS' GUIDE ISSUE. Here they actually come *looking for you!*

When busy management men in the Chemical Process Industries turn to the GUIDE, they're on the verge of a buying decision. This is advertising's most meaningful moment—the clincher that makes your whole program click... when more than 50,000 important CPI buyers go shopping for what you have to sell. And they'll come here, not once or twice, but dozens of times throughout its 365 active days of service.

Remember... more CPI buyers receive it and buy from its pages than any other catalog or directory ... its completeness of content and wide distribution have made it the best-used purchasing reference in the market.

So why not insure an adequate program next fall by scheduling it *now* when you're lining up your new 1962 advertising plans? The BUYERS' GUIDE ISSUE will bring back business for 12 solid selling months. Get it in there big... in your budget *today!*

1962 BUYERS' GUIDE ISSUE of Chemical Week

Flatow's work is devoted to private contract development.

Maker's Market: The lab has given Flatow the means to develop some products, which it sells along with those of its suppliers. For instance, it has developed an emulsifier, Refco M, which provides a safe and simple technique for emulsifying unoxidized waxes (which Flatow sells, too). Not only does the emulsifier help sell wax but also it has opened some markets on its own—e.g., in the formulation of concrete curing and sealing agents, lumber sealants, and mold-release agents. It's also being studied for use in a temporary, glass-beaded traffic paint (it's relatively unaffected by water but it can be removed with a detergent solution).

Another emulsifier, Refco K, is used in the manufacture of waterless hand cleansers. Features: it keeps these ordinarily gel products in liquid form for a day, which sometimes permits savings in handling, and also it allows formulation without kerosene. Three companies (two West Coast, one Eastern) will soon have waterless cleaners on the market made with Refco K.

Flatow now has the Refco products made for it (although the final operations are done by Flatow) but when it moves to new quarters late next year it will make them from start to finish.

In addition to the emulsifiers, Flatow puts its tradename on a line of waxes (Refcowaxes) most of which it compounds or blends to suit its customers' needs.

Scenting Services: As the company has moved deeper into product formulating, it has found that a growing part of its business—since it is developing unique formulations for specific customers—lies in finding specific masking agents and perfumes to meet customers' needs.

A similarly developed sideline is the distribution of special equipment. For example, Flatow has become equipment representative for J. M. Lehmann (Lyndhurst, N.J.) ink mills and other dispersing equipment, made by The Eppenbach Division of Gifford-Wood Co. (Hudson, N.Y.).

Teamwork: The success that Flatow has enjoyed so far can probably be ascribed to a strong combination of technical and financial background on the part of its founders. Robert Flatow provides the technical savvy. He worked for Hardesty Chemical Co. (Now Harchem Division of Wallace and Tiernan) after the war, was assistant to the vice-president-general manager. He also spent three years as U.S.-Canadian manager of Brazil Oiticica Inc., (New York), a marketer of oiticica and castor oils.

President of the company—and like Flatow, a 45% owner (Sales Manager J. O'Farrel owns the remaining 10%)—is Edwin Meares, former assistant credit manager of the Chemical Bank of New York. He provides the financial know-how.

With many chemical makers already down to the barest margins themselves, it's unlikely that chemical manufacturers will be able to give fatter margins to their distributors. More and more companies, as a consequence, may find—as Flatow has—that they will have to pay for the needed services that make their sales really grow.

'Born in England'

Federal Paint Co. (Newark, N.J.) has begun newspaper advertising of a non-do-it-yourself-type premium white enamel, called Cavendish Imperial. The product is marketed in imperial gallons (5 U.S. qts.) and Imperial quarts (about 2½ U.S. pts.) at $9.95 and $2.80, respectively. It is sold only in white (high gloss and satin) and will be available within a 50-mile radius of New York City. Although the paint is promoted as "born in England," it's being made in Federal's Newark plant. Federal is the U.S. Branch of British Paints Ltd. (Newcastle).

EXPANSION

Zep Steps Out: Zep Manufacturing Corp. (Atlanta, Ga.), maker of industrial maintenance and sanitary chemicals, has acquired Ludwig Wilson Co. (Chicago) a 52-year-old company in the same line. The acquired firm will retain its name as a division of Zep.

•

Gulf Goes to Groceries: Gulf Oil Corp.'s line of household products will soon be marketed in groceries and supermarkets in 39 states via food brokers. The products will continue to be sold also in the company's 32,000 service stations. Household insecti-

Your 6 Best Reasons for reserving space now in The 1962 Buyers' Guide

1. Distributed by paid circulation only, to over 50,000 *(1962 issue)* CPI management men... the identical ABC-audited audience of CHEMICAL WEEK... with greater distribution than any other CPI directory, either paid or free.

2. Referred to many times monthly *(5 to 7 on the average)* as a purchasing source by managers in all functions... *research, design, construction, production, plant operations, purchasing, sales, administration.*

3. Used by 24% more chemical buyers than any other directory or catalog of all kinds... *70% of subscribers have buying influence for chemicals, 67% for plant equipment, 70% for lab equipment.*

4. Eight full directories under one cover ...(1) *Chemicals Company Directory* (2) *Chemicals Catalog Section* (3) *Chemicals, Raw Materials, Specialties Directory* (4) *Chemicals Tradenames Directory* (5) *Equipment Company Directory* (6) *Equipment Catalog Section* (7) *Equipment, Containers & Supplies Directory* (8) *Equipment Tradenames Section.*

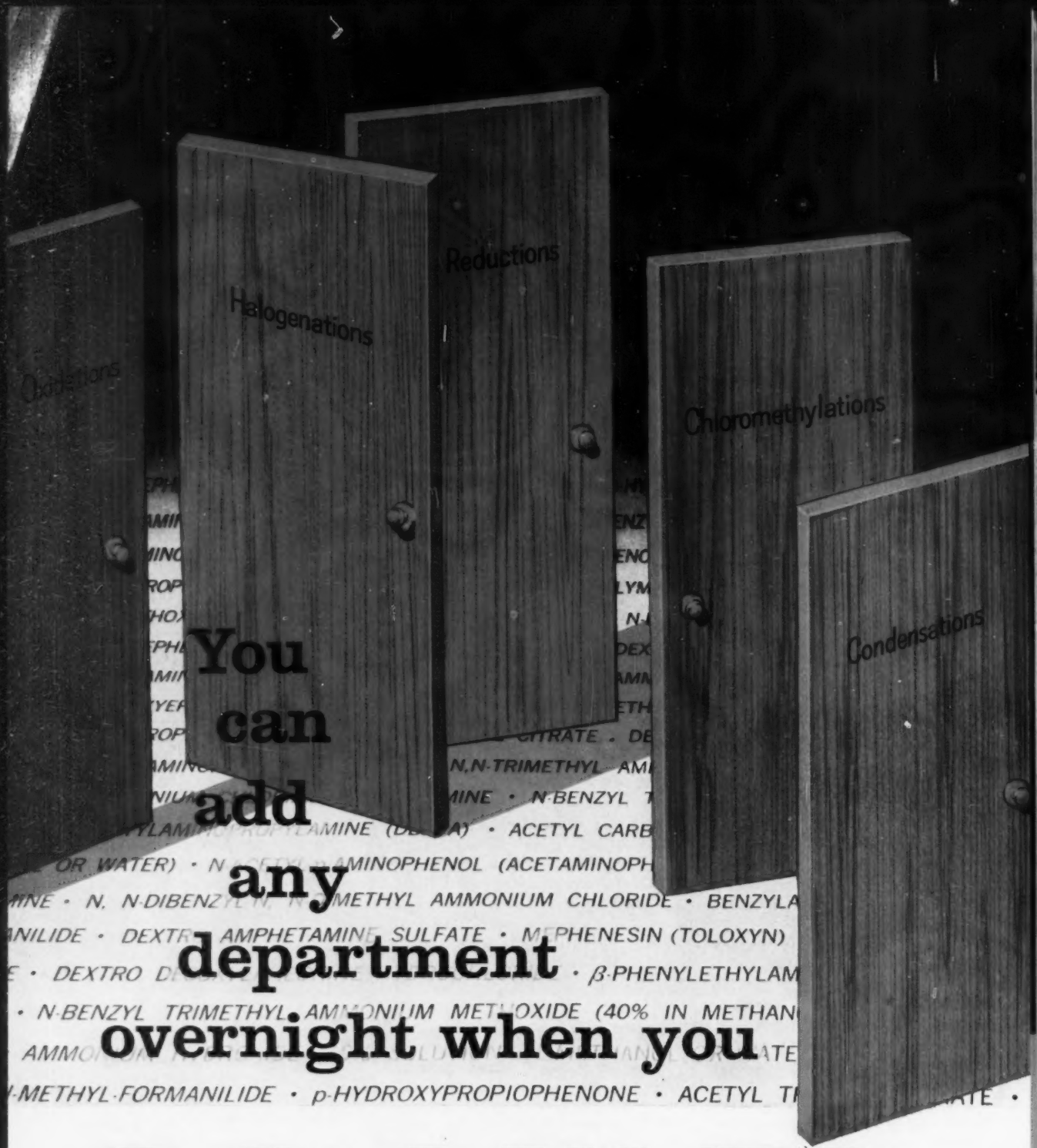
5. Completely flexible to the advertisers' needs. You may use *fractionals, full pages, spreads, inserts or your entire catalog*... any or all spotted precisely in the section where your advertising will do you the most good.

6. This is low-cost, long-life advertising that works indefatigably for you 52 weeks a year... with no increase of regular CHEMICAL WEEK rates. *Published September 29, 1962. Closing June 16th.*

Chemical Week

1962

BUYERS' GUIDE ISSUE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You can add any department overnight when you
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Your doorway to diversification... may be right here. A truly versatile fine organics plant like Miles, with the facilities and inclination to do custom products work, can do a lot of things better than you might be able to do them for yourself.

It can bring specialized experience to bear on a wide variety of problems that might be new to you. It can be your "pilot plant" during the formative stages of a new product. It can be your "borrowed" equipment and experience, eliminating a large capital expenditure on your part. Sometimes you can reach a desired chemical goal or an intermediate step faster — sometimes cheaper — with the help of a fine organics firm likes Miles.

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MM-6-1

NOPCO

A SKILLED HAND IN CHEMISTRY... AT WORK FOR YOU

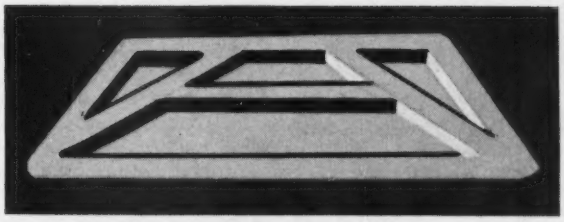
OVER 180 NOPCO CHEMICAL ADDITIVES HAVE FDA-CLEARED COMPONENTS...

... stand at the service of the food packaging manufacturer

FDA clearance is essential for products used in the packaging and distribution of food. As a supplier of processing chemicals to the paper and adhesives manufacturer, Nopco offers a wide range of chemicals carrying FDA-cleared components . . . perhaps the most extensive in their class.

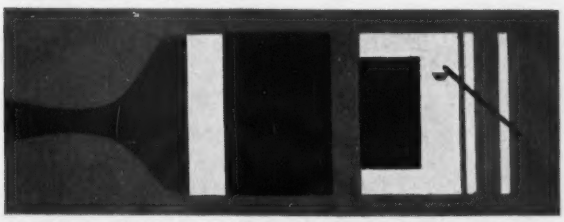
To the paper and paperboard maker, Nopco offers no fewer than 116 pulp and paper defoamers having FDA-cleared components. Since no one defoamer performs equally well in all paper systems, this wide variety of products enables papermakers to find the chemicals best adapted to their operations.

For the adhesives manufacturer, Nopco has defoamers, stabilizers, thickeners, resin emulsions, dispersants and wetting agents, all having FDA-cleared components.



Lubricant prevents breakdown during high-speed aluminum rolling

An important new lubricant additive for aluminum rolling is Nopco® 9390. It is "prior sanctioned" by the FDA for use in producing aluminum sheet and foil for food wrapping. In preventing breakdown of the sheet as it is rolled out at high speed, it is an aid in increasing rolling speeds by some 400 ft. per minute.



Better pigment dispersing in latex paints

A highly effective dispersant for latex paints is Lomar® PW. Two to 5 lb. per 100 gal. of paint is the usual ratio. Its use results in improved leveling characteristics and minimum floating, flooding and pigment settling. During pigment grinding, it breaks up agglomerates, permits the grinding action to be exerted on individual particles rather than upon flocs. This results in faster grinding, higher amounts of pigments in the slurry, and reduced viscosity.

Synthetic waxes replacing natural in many industrial processes

The synthetics are not subject to the variations found in natural waxes and they can be used alone or in blends. Nopcowax® 22-DS has extraordinary advantages well known to industry. As a mold lubricant and antiblocking agent in the treatment of rubber, metal and vinyls, it can be applied directly to mold surfaces to aid in mold release. It also has important uses in manufacturing adhesives, asphalt, metallic powders, paper coatings.

Nopco Chemical Co., 60 Park Place, Newark, N.J.
Please send further information on ☐ Nopco 9390
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Data sheets are available on all these chemical specialties. Fill in the coupon for information.

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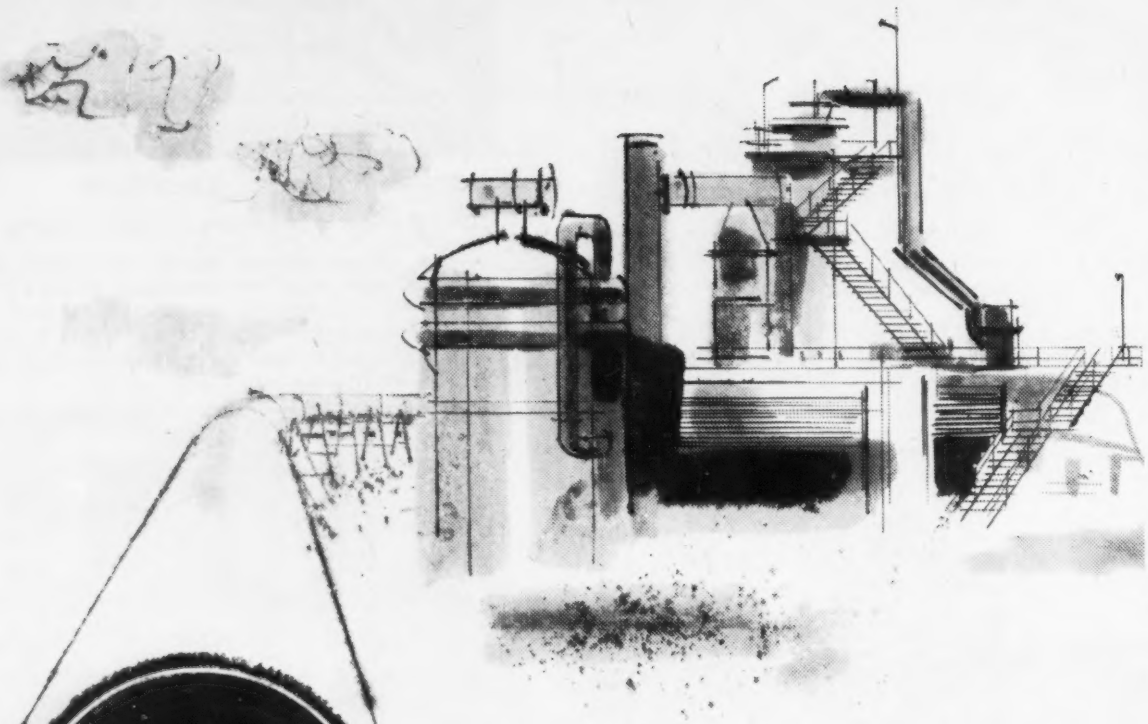

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Bulk Acids from Du Pont I&B*

Your operating schedules and production standards are the controlling factors when we undertake to supply your acid requirements.

Our performance for you starts in manufacture, where every effort is made to control processes to meet your most exacting and critical demands.

To assure you of continuous supply, Du Pont has multiple plant locations, extensive land and water delivery facilities, and wide background in handling chemicals.

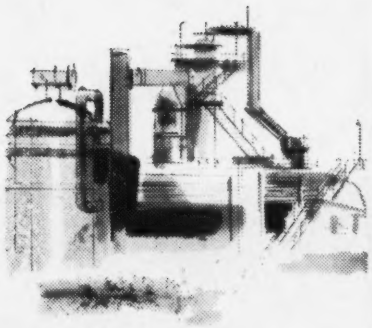
And this new department—I & B—is also a reliable source for a diversity of other chemicals—basic, special-purpose, and developmental.

Write our nearest office (listed on the opposite page) for the current I & B "Index of Industrial Chemicals". Also see our listings in the Chemical Week Buyers' Guide and the Chemical Materials Catalog.

• • •

Acids: Adipic, Chlorosulfonic, Diglycolic, Formic, Hydrochloric, Hydroxyacetic, Lactic, Oleum, Phosphoric, Sulfamic, Sulfuric.

DU PONT BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY | *I&B INDUSTRIAL CHEMICALS Industrial & Biochemicals Department



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GRant 1-5427

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BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

cides are primary products to be pushed. These include Gulf Spray Aerosol, Quick Action Gulf Spray, Gulf Roach Ant Killer, Gulf Ant-Roach Bomb, Gulf Moth Proofer. Other products to be marketed: a household oil, lighter fluid, a livestock spray and a paraffin wax.

•

Sears in Drycleaning: Sears, Roebuck & Co. (Chicago) has entered the $300-million/year coin-operated drycleaner business, will soon set up two self-service drycleaning operations adjacent to two of its retail stores (one in Kankakee, Ill., the other in Waukegan, Ill.). The company plans to add more drycleaning units to its 741 retail outlets, may also install automatic laundry devices at the same spots.

•

New Division: Richardson Co. (Melrose Park, Ill.) has formed a new chemicals division to consolidate the administration and operation of its two chemical-producing subsidiaries, Treplow Chemical Co. (Paterson, N.J.) and Krystall Chemical Corp. (Chicago). Both firms produce surface-active chemicals used in the production of soaps, cosmetics, cleaning compounds.

PRODUCTS

Fluid Sight Savers: Dow Corning Corp. (Midland, Mich.) has begun marketing its Sight Saver as a spray product. (It was previously sold only as silicone-tested tissues.) The product comes in a ½-oz. aerosol container (good for 300 metered sprays). Retail price $1.25.

•

Fabric Finish: Metro-Atlantic Inc. (Centredale 11, R.I.) has added to its product line a resin-base water repellant finish for natural and synthetic fabrics. It's called Ranedare PF, may be applied by conventional textile processing methods.

•

Nonionic Color Dispersions: A new line of nonionic color dispersions for waterpaint systems is being marketed by Hilton-Davis Chemical Division of Sterling Drug (Cincinnati) under the tradename Super Seatone.

•

Fusible Silicone Rubber: Union Carbide Corp.'s Silicones Division has developed a fusible silicone rubber base for fabricating electrical insulating tape. Called Y-3277 base, the material is supplied with a special catalyst masterbatch YC-3277, which is said to assure a nonblooming tape. Tapes made from the base are clear, neutral or colored, have high tack and good surface tack, according to the company. The base is sold in 25-lb. and 50-lb. cartons.

•

Spray Gun: Binks Manufacturing Co. (Chicago) has introduced a two-component spray gun, Model 18F, for internal mixing. The gun handles low-viscosity urethane foams (2,000 cps. or less) and polyester resin systems, and can spray or spray-pour these materials.

•

Lubricant: American Resin Corp. (3215 North Sheffield Ave., Chicago 13) is now selling Spray-Graph, a liquid graphite lubricant, in 6-oz. and 16-oz. aerosol containers. According to the firm, Spray-Graph is unaffected by high or low temperatures, will bond to all metallic and nonmetallic surfaces to form a dry, long-lasting, lubricating film.

•

Nylon Adhesive: Radiation Applications Inc. (36-40 37 St., Long Island City 1, N.Y.) has added to its product line an adhesive for bonding nylon to nylon surfaces. The adhesive, called Raiseal 5002, is a thermosetting resin, gives heat stability, according to the company, at temperatures above the softening points of most plastics. Applications: bonding nylon to metal and plastic surfaces.

•

Floor Wax: Simoniz Co. (2100 Indiana Ave., Chicago 16) is test marketing its Master Wax, a detergentproof floor wax, in Providence, R.I., the Cincinnati-Dayton area and San Diego, Calif. According to Simoniz, this floor wax is the first that can be washed repeatedly with household detergents and soaps without losing its shine.

•

Terpolymer: T. F. Washburn Co. (2244 Elston Ave., Chicago 14), a subsidiary of Purex Corp., Ltd., is offering an acrylic-vinyl terpolymer called Flex-A-Pol for latex paints. Among the film characteristics, according to the firm, is outstanding flexibility and water resistance.

•

Detergent: Continental Wax Corp.

HARDWORKING JEFFERSON CHEMICALS

PROPYL

Propylene Glycol adds a Venus touch

U.S.P. grade propylene glycol's beauty lies in its low toxicity and excellent solvent, hygroscopic and preservative properties. In cosmetics its solvent properties help obtain a more intimate dispersion of soaps, oils, waxes, greases, and other substances in water . . . help maintain the desired viscosity of an emulsion. Propylene glycol also adds to the rapid and complete dispersion of dyes and perfumes throughout a cream or lotion. Its hygroscopicity helps retain the texture and consistency of cosmetics during use . . . enhances the soothing emollient action upon the skin.

Because of its low toxicity, Propylene Glycol, U.S.P. is your most versatile polyol for use as a color emulsion solvent in food flavoring and a humectant in packaged foods. It is also used in cork seals and cellulose coatings that contact food. In tobaccos, propylene glycol helps maintain proper moisture content over a wide range of humidities.

Industrial grade propylene glycol and dipropylene glycol are widely used as intermediates for polyester and alkyd resins, as a basic component for hydraulic fluids, as softeners and plasticizers, as solvents in steam-set printing inks and in solvent-extraction processes. Jefferson's technical service people can be most helpful in your special application problems.

ENE GLYCOL

Industrial and U. S. P. Grades

PROPYLENE GLYCOL

SPECIFICATIONS

INDUSTRIAL GRADE:

Specific gravity, 20/20°C.	1.0375 min. 1.0390 max.
Acidity as acetic, wt.%	0.005 max.
Water, wt.%	0.2 max.
Color, Pt-Co scale	10 max.
Ash, wt.%	0.005 max.
Boiling range, ASTM, °C.	185-189

U.S.P. GRADE:

(Same as specifications for Industrial Grade with the following exceptions:)

Boiling range, ASTM, °C.	186-189
Acidity as acetic, wt. %	0.003 max.
Chlorides as Cl, wt. %	0.0001 max.
Sulfate	None
Arsenic as As_2O_3, ppm	1 max.
Heavy metals as Pb, ppm	5 max.

SELECT PROPERTIES

Boiling point, 760 mm.	187.4°C.
Flash point (open cup)	225°F.
Melting point	<–60°C.
Molecular weight	79.09
Specific gravity, 20/20°C.	1.0381
Viscosity, 20°C.	60 centipoise
Weight, 20°C.	8.62 lbs./gal.

Select Properties same as for Industrial Grade Propylene Glycol

DIPROPYLENE GLYCOL

SPECIFICATIONS

Specific gravity, 20/20°C.	1.020 min. 1.025 max.
Acidity as acetic, wt.%	0.01 max.
Water, wt.%	0.1 max.
Color, Pt-Co scale	15 max.
Boiling range, ASTM, °C.	222-238

SELECT PROPERTIES

Boiling point, 760mm.	231.8°C.
Flash point (open cup)	280°F.
Viscosity, 20°C.	107 centipoise
Weight, 20°C.	8.5 lbs./gal.
Molecular weight	134.17
Specific gravity, 20/20°C.	1.0252
Melting point	<–60°C.

SHIPPING AND HANDLING

Propylene glycols are available from Jefferson in 4,000-, 6,000-, 8,000-, 10,000-gal. tank cars, tank wagons in most areas, and 55-gal. resin-lined drums.

The handling and storage of these glycols is in most cases a straighforward operation. They present no hazard of explosion, polymerization, fire, health, or other industrial risk. They are hygroscopic and have extremely low vapor pressures. There are, however, certain uses requiring extra protection against contamination during handling and storage . . . explained in detail in our technical literature.

TECHNICAL INFORMATION

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JEFFERSON CHEMICALS

A LOW COST* SOURCE OF SOLUBLE ZIRCONIUM

SODIUM ZIRCONIUM SULFATE, TECH.

Have you considered it for stabilization of organic and inorganic pigments . . . for precipitation (fixation) of soluble carbohydrates, proteins, gelatin and glycol on paper, cloth and glass fibers . . . for water treatment . . . for improved retention of opacifiers in paper.

*16¢ per pound — F. O. B. Niagara Falls, N. Y. Price subject to change without notice.

The answer to a specific problem or an improvement in present processing may reside in this unique compound. Our field representatives and laboratory specialists will be glad to assist in the exploration of possibilities.

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HQ FOR Zr
COMPOUNDS AND CHEMISTRY

(Mt. Vernon, N.Y.) will soon begin marketing its Cool Magic, which it claims is a broad-spectrum cold-water detergent-soap combination. Cool Magic, a liquid to be sold in plastic bottles, will be used for clothing that should not be washed in hot water.

•

Parting Agent: Dow Corning Corp. (Midland, Mich.) has made commercial a paintable silicone parting agent, which, claims the company, combines high-release efficiency with high-degree compatibility for paints, finish coats and adhesives. The agent comes in two forms: Dow Corning 230 Fluid and Dow Corning 231 Emulsion, a water-dilutable dispersion.

•

Silicone Paste: General Electric's Silicone Products Dept. (Waterford, N.Y.) is marketing a white, all-purpose silicone rubber paste, designed for high- and low-temperature industrial sealing, patching and calking applications. Called RTV-77, the new thixotropic paste cures to a solid rubber material, can be bonded to metal and other surfaces. Price ranges from $6/lb. in small quantities to $3.85/lb. in purchases above 100 gal.

•

Metal Finishing Entry: Colloids, Inc. (394-8 Frelinghuysen Ave., Newark, N.J.), has formed a Metal Processing Chemicals Dept. to supply chemical specialties to the metal-finishing industry. Its line will include alkaline cleaners, phosphating compounds, drawing compounds and aluminum etchants. John C. Lum, formerly with Pennsalt Chemicals, will manage the new operation.

•

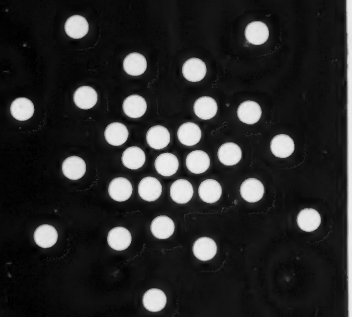
Low-Cost Air Fresheners: S.C. Johnson & Son (Racine, Wis.) has begun marketing a new type of water-based aerosol air fresheners. They do not contain the conventional naphtha-type carriers, hence don't need heavy masking agents. The products carry the name Glade Mist; a 7-oz. unit retails for 69¢.

•

Dandruff Fighter: Procter & Gamble has entered an antidandruff shampoo called Head & Shoulders. "Fair trade" prices: 5-oz. and 2.4-oz. jars, $1.75 and 89¢, respectively; 2.7-oz. and 1.7-oz. tubes, $1 and 69¢. Active ingredient: zinc 2-pyridinethiol 1-oxide.

NOW!

ACID SOLUBLE-ACID DISPERSIBLE ACRYLIC COPOLYMER EMULSIONS



NeoCryl A-410 and NeoCryl A-400 Spark A Wealth Of New Specialty Ideas!

At last you have acrylic copolymers that aren't affected by water, soap or alkaline detergents, even after repeated exposure, yet are easily removed with any mild acidic cleaner.

These new polymers contain functionally active groups capable of interacting with carboxyls, acid anhydrides, acid chlorides, epoxies, lactones, aldehydes and sulfhydryls — such as may be present in natural and synthetic fibers, coatings and films. Some possible uses include textiles (antistatic agents, improved dyeability), adhesives, photographic chemicals, paper coatings and floor polishes.

FOR COMPLETE DETAILS, SAMPLES AND TECHNICAL SERVICE, WRITE, WIRE OR PHONE TODAY!

Raw Materials For Specialty Chemical Processors

POLYVINYL CHEMICALS

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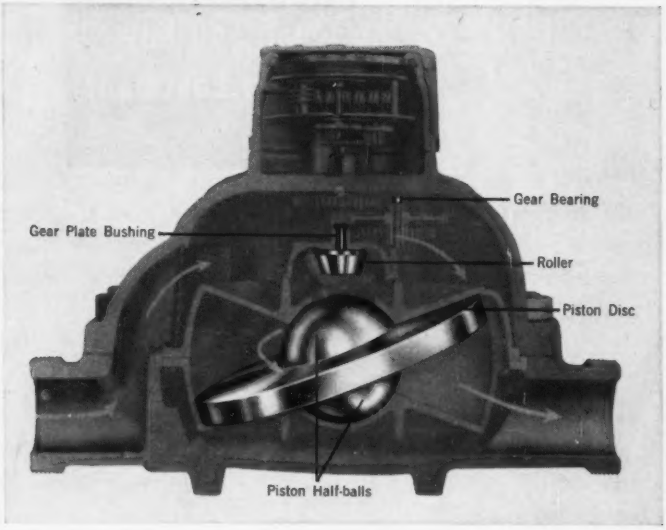
Chemical Division 3M COMPANY



KEL-F® BRAND PLASTIC foils corrosive attack, keeps meters on the mark!

Equipment that measures even highly corrosive liquids can be enduringly exact, too! Buffalo Meter Company manufactures meters that measure precisely the flow of over 100 corrosive chemicals, including acetic acid, aluminum nitrate, carbon bisulfide, diethylamine, phosphoric acid, potassium chloride and concentrated sulphuric acid. Vital meter parts—piston discs, half balls and other components, as shown—are made of KEL-F Brand Plastic because it retains its shape and dimension in the presence of corrosive chemicals, even fuming nitric acid.

Other properties which led to the selection of KEL-F Plastic for this application include stability, easy moldability, low cold flow, low specific gravity and good lubricating qualities. The five meter components of KEL-F Plastic are molded for Buffalo Meter Company by Resistoflex Corp., Roseland, N.J., and the Garlock Packing Co., Palmyra, N.Y.

Now, new KEL-F 81 Plastic incorporates many property advantages, along with better-than-ever uniformity and consistency. For more information, read the "profile" to the right, then return the coupon below.

Chemical Division, Dept. KAK-121
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TELL ME MORE...
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Properties Profile

on

KEL-F® BRAND 81 PLASTIC

KEL-F 81 Plastic is a fluorocarbon plastic, a thermoplastic resin formed by the homo-polymerization of chlorotrifluoroethylene. The high degree of fluorination of KEL-F 81 Plastic is responsible for its chemical inertness and thermal stability. The inclusion of chlorine in an otherwise carbon-fluorine molecule results in exceptional moldability and mechanical toughness.

Crystallinity. KEL-F 81 Plastic is crystallizable, but not necessarily crystalline, the degree and kind of crystallinity in a given sample being a function of its thermal history. The "quick-quenched" resin is spoken of as amorphous, and the "slow-cooled" resin as crystalline. When crystalline, KEL-F 81 Plastic is a denser, more translucent material with higher tensile modulus, lower elongation, and greater resistance to the penetration of liquids and vapors. The amorphous plastic is less dense, more elastic, with greater optical clarity and toughness.

Physical Properties. The physical properties of KEL-F 81 Plastic combine mechanical, chemical, electrical, and optical advantages. And the most useful applications center around combinations of the following properties:

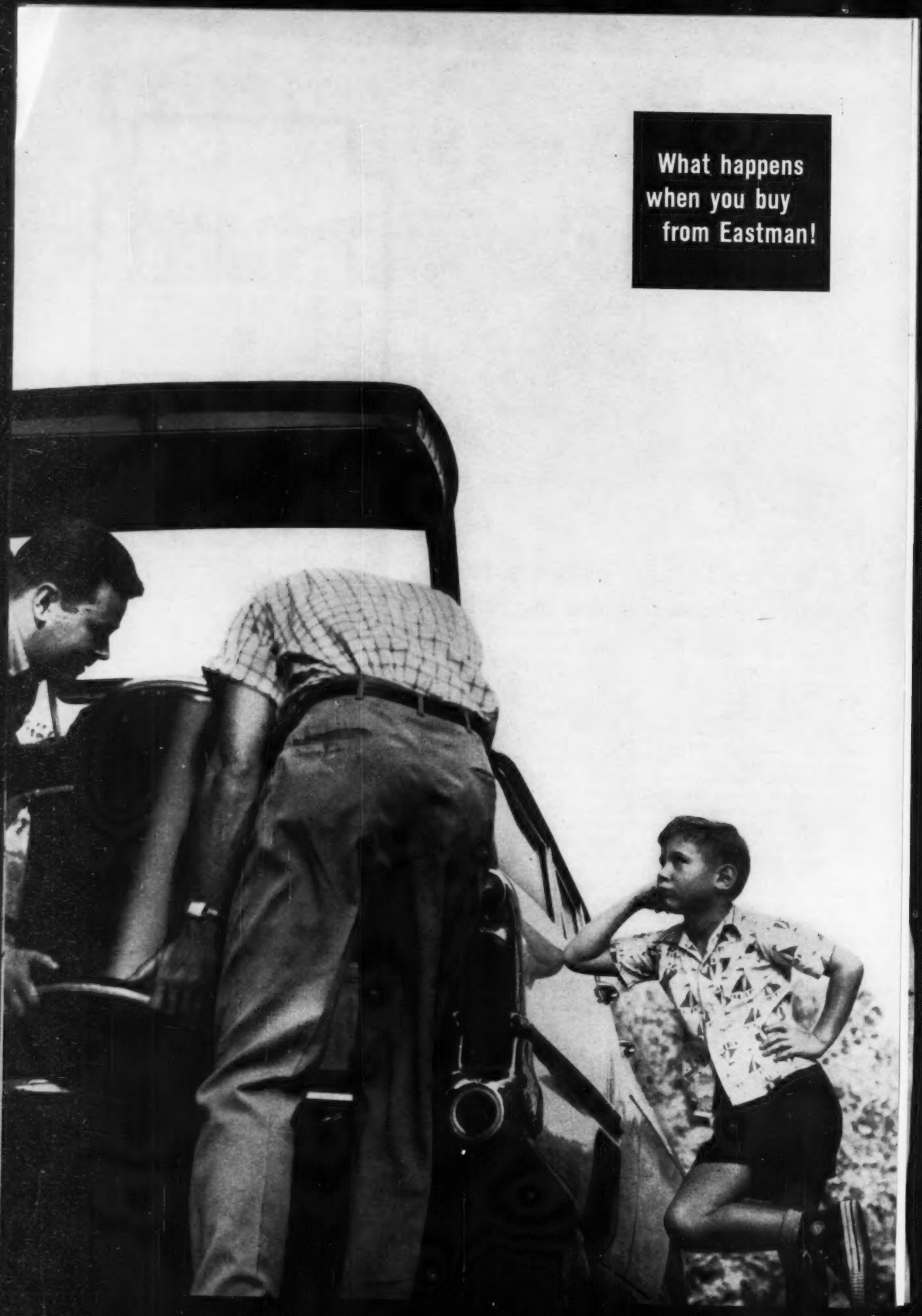
1. Useful temperature range: from —400° F. to +400° F.
2. Resistance to deformation and flow at high temperatures, pressures
3. Zero moisture absorption
4. Abrasion resistance
5. Radiation resistance
6. Chemical resistance
7. Electrical properties
8. Infrared transmission
9. Inert to liquid oxygen
10. Flexible in contact with cryogenic fuels

Processing. KEL-F 81 Plastic can be processed in the same manner as other thermoplastic resins. Parts of KEL-F 81 Plastic may be specified in any form.

Detailed data on physical properties is contained in a new free brochure. For your copy, return coupon or write to 3M Chemical Division, stating area of interest.

"KEL-F" is a reg. TM of 3M Co.

MINNESOTA MINING & MANUFACTURING CO. 3M


What happens
when you buy
from Eastman!

Check-up, *Tenamene®3*, shoes and ice cream

"Saturdays are for shoes and ice cream and visits to the doctor," mused a Wilson & Geo. Meyer & Company* salesman, "and occasionally for keeping a customer in business over the weekend. Like the time I had Andy, my seven-year-old, down for a regular check-up, and had to delay the shoes and ice cream part long enough to handle an emergency order.

"A customer of mine had unexpectedly run out of Tenamene 3 gasoline additive (2,6-ditertiary butyl-p-cresol). Their purchasing agent traced me to the doctor's office, explaining that a back order for this material from another supplier had not arrived as scheduled, and that they urgently needed the additive for process operations already in progress. So I agreed to meet him at our warehouse, fortunately only about ten minutes away.

"When I arrived, the purchasing agent was already there, backing his station wagon, tail-gate down, up to the loading platform. I opened up the warehouse and using a hand truck moved out two drums of Tenamene 3, then helped the P.A. wrestle the drums into the back of his station wagon.

"Mission accomplished! In time, also, to satisfy Andy's requirements for size fives plus a double dip."

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**Our Western Sales Representatives*

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TENAMENE 1
An aminophenol. Low cost, efficient gum inhibitor for motor fuel.

TENAMENE 2
A di-sec-butyl-p-phenylenediamine. Versatile gum inhibitor for motor fuels and aviation gasoline. Also acts as a sweetening agent in many catalytically cracked stocks.

TENAMENE 3
An alkylated phenol. Efficient gum inhibitor for motor fuels, aviation gasolines and jet fuels.

TENAMENE 4
A di-heptyl-p-phenylenediamine. A new, economical inhibitor/sweetener for gasoline, similar in many respects to Tenamene 2, particularly valuable where sweetening action is required more than gum inhibition.

TENAMENE 60
A powerful copper deactivator.

TENAMENE MD 50
A freeze-resistant solution containing copper deactivator.

For information on how to use Tenamene gasoline additives, send for Bulletin I-106.

For properties and shipping information on these and other Eastman products, see *Chemical Materials Catalog*, page 225, or *Chemical Week Buyers' Guide*, page 113.

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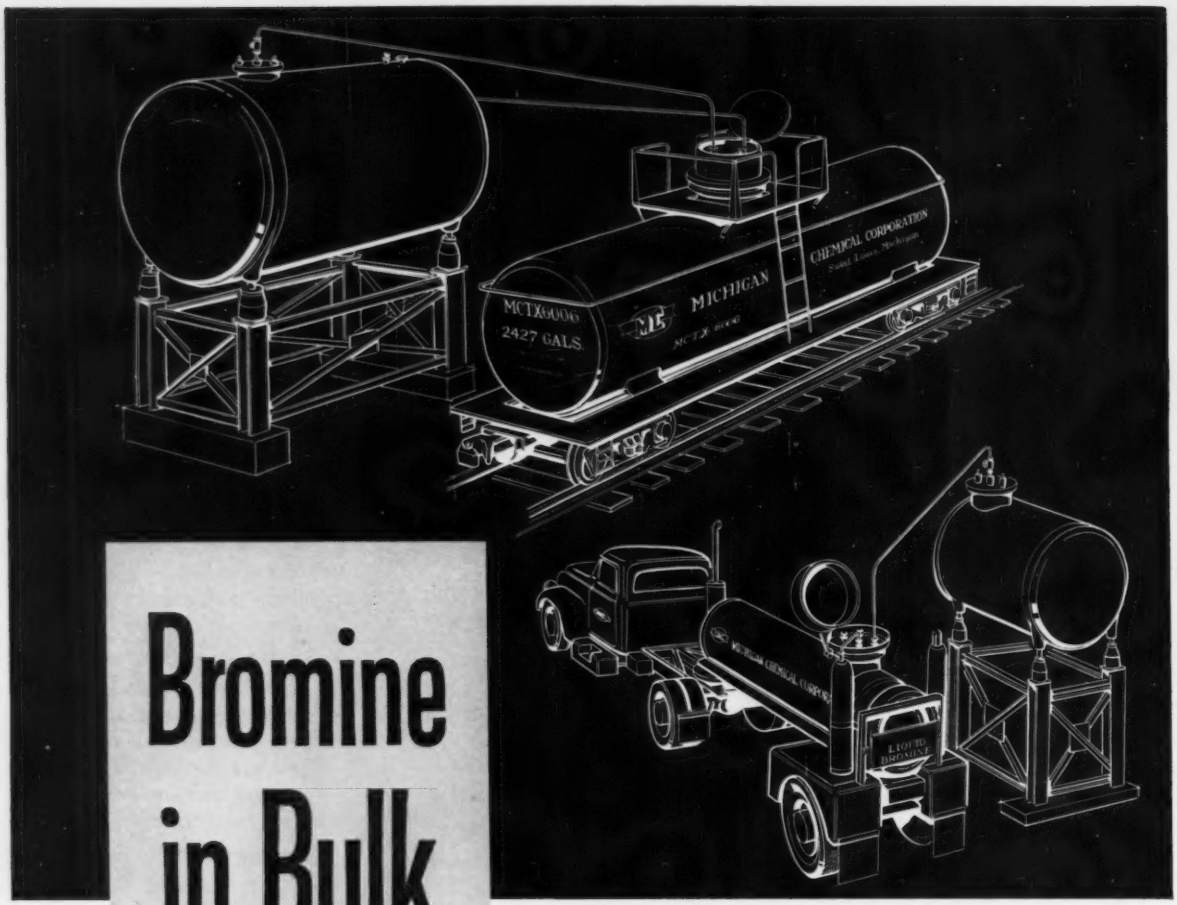

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LOOK AT THESE ADVANTAGES: Thousands of dollars a year can be saved by converting facilities to receive bromine in bulk. For example, with tank car orders, you save 9½¢ a lb. as compared to the drum price; 10½¢ a lb. over bottles. With tank truck orders, you save 7¢ a lb. over drums and 8¢ a lb. over bottle shipments. You will free considerable capital now tied up in container deposits. Finally, you will save both time and money now used in handling the smaller bromine containers.

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WE CAN SHOW YOU HOW! Our experience in the storage and handling of bromine is extensive and we want to share it with you. If you would like engineering prints, specifications, and technical counsel, get in touch with us. Michigan Chemical also offers you these advantages: A steady, uncommitted supply of bromine at tonnage prices; and a large bromine bulk fleet for prompt service.

Bulk shipments from: El Dorado, Arkansas and Manistee, Michigan. Drums and bottles from Manistee and convenient warehouse locations.

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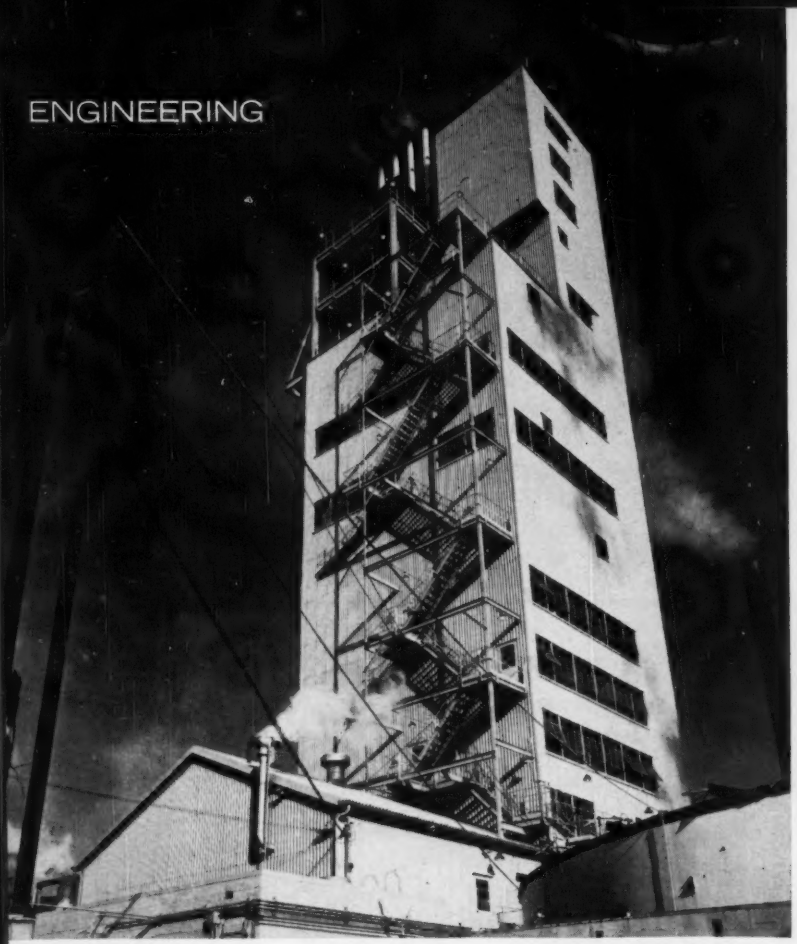


Atlantic's catalyst-cleaning process is housed in 185-ft. tower.

Bonus in Catalyst Cleanup

Last week Atlantic Refining Co. (Philadelphia) unveiled a new commercial process that decontaminates fluid cracking catalysts (FCC). The new technique, called Met-X, uses ion-exchange principles to remove metallic poisons. Atlantic expects the catalyst-cleaner to save it at least $1 million in '62.

Removing metal contamination from a catalyst, says Atlantic, permits a petroleum firm to hike its profits threefold by:

(1) Increasing the capacity of existing catalytic-cracking units. As Atlantic sees it, FCC operators—there are about 125 units in the U.S.—that install Met-X will be able to boost capacity of their units up to 20% by reducing coke formation on the catalyst.

(2) Producing a more valuable product mix, while at the same time cutting deeper into available crude oils for FCC feedstocks. Almost everything but the asphalt will be used.

(3) Reducing operating costs. Withdrawal of spent catalyst can be eliminated and catalyst consumption reduced to that lost as stack dust from attrition—as little as 0.1 lb./bbl. Since less volume of catalyst is required, it's likely that the more selective, more expensive types (*CW, July 30, '60, p. 49*) can be used.

The Process: Atlantic has hustled its process into commercial operation before final design parameters and process patents were developed. Therefore the company is holding back on all but the basic details. At the same time, the firm gives credit to Pfaudler Permutit Inc. for helping to work out the ion-exchange system.

Briefly, the process involves two parallel circuits: catalyst and resin (*see p. 96*). The catalyst circuit has five steps; the resin circuit has four; and two steps are common to both circuits. Catalyst is drawn from the FCC regenerator and cooled. Cooled catalyst then passes to an ion-exchange reactor, where the resin, mixed with the catalyst in a slurry of water, scavenges active metal ions from the catalyst particles.

From the reactor, the catalyst-resin slurry passes to a separator, where the catalyst is recovered and sent through a concentrator to a dryer. From the dryer, the cleaned catalyst is returned to the FCC regenerator.

Meanwhile, the ion-exchange resin is mixed with demineralized water before being fed through the reactor and separator. Resin recovered from the bottom of the separator is sent through a regenerator. There, both water and metal contaminant are removed, while the resin goes back to fresh-resin storage.

This process is installed in a 185-ft.-high plant at Atlantic's Philadelphia refinery (*picture, left*). Air-lifts are used for catalyst and resin transfer. But Atlantic engineers say this tall design resulted largely from space limitations; the unit could be brought closer to the ground where more land space is available.

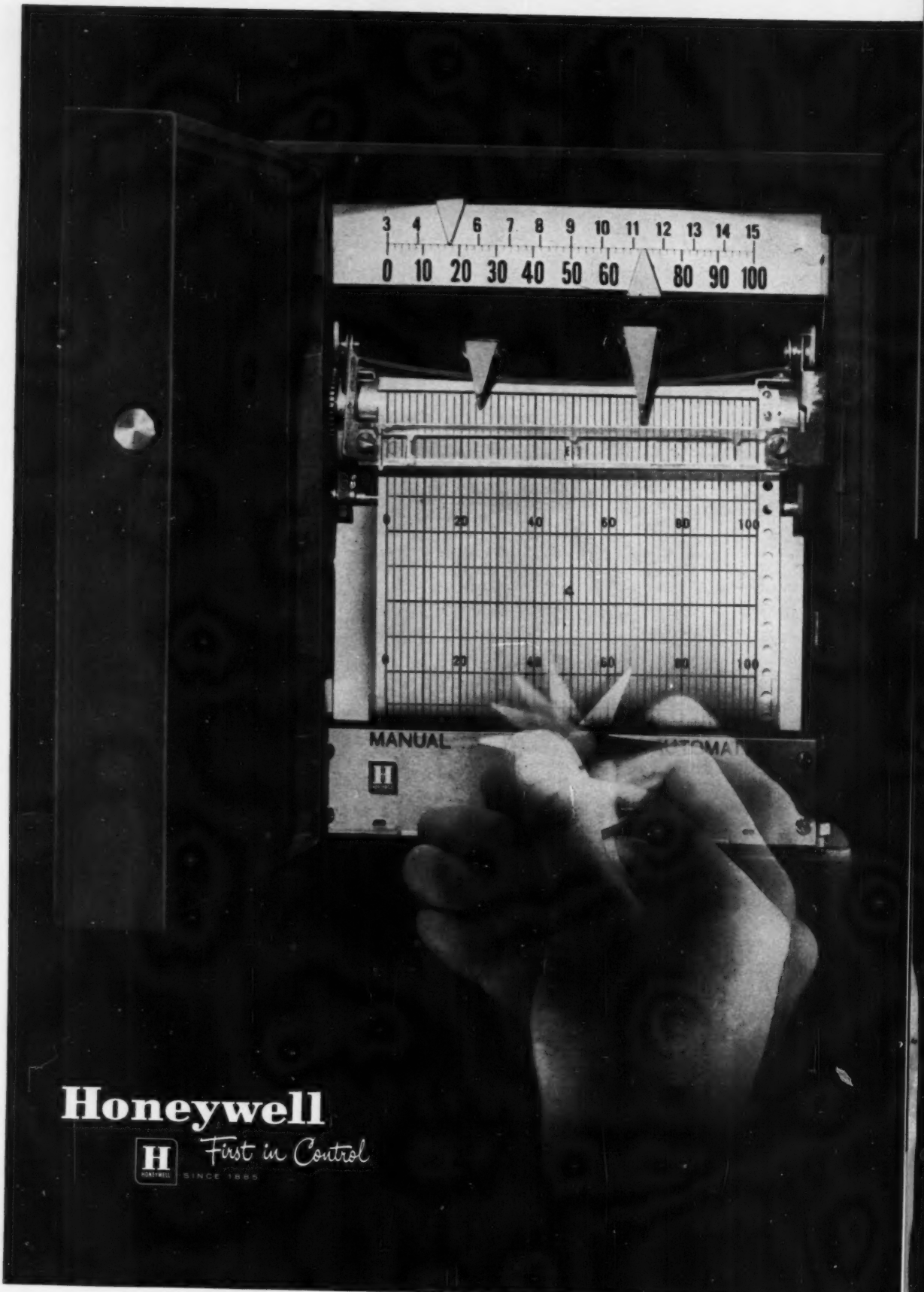
Principles Involved: Patent literature is loaded with systems for eliminating metal contaminants from FCC catalysts. But none of the proposed systems has so far proved itself commercially.

Atlantic, which utilizes a chemical approach, explains the theory of its process this way: the extraction of metals from catalyst is a difficult problem because the catalyst attracts metal ions. Atlantic's answer is to add a scavenging agent, namely an ion-exchange resin, to the catalyst slurry.

Result: under the proper reaction conditions, the metal contaminants, which produce the excess coke and gas, are selectively removed from the silica-alumina cracking catalyst. The Met-X-treated catalyst reportedly has a selectivity comparable to that of a completely clean catalyst. The feature of the process, as Atlantic sees it, revolves around the pitting of one ion-exchange material against the other—i.e., the ion-exchange resin, with its affinity for metal ions, versus the weaker silica-alumina cracking catalyst.

Atlantic declines to reveal just how this ion-exchange balance gets results. It does say that the conditions are very critical.

Hub of the Refinery: By improving FCC operations, the Met-X process


3 4 6 7 8 9 10 11 12 13 14 15
0 10 20 30 40 50 60 80 90 100
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New Honeywell PneumatiK Tel-O-Set Instrumentation

Honeywell brings new features, new performance to small case instruments with the introduction of *PneumatiK Tel-O-Set Instrumentation.* Here are just a few of the many new features:

Automatic Switching Just a flip of the control lever switches the instrument from automatic to manual or vice versa. There are no bumps, no delays, no matching of pressures required. This simplified switching makes cascade control systems practical for the operator.

Easily accessible adjustments Zero and damping adjustments to pen can be made while the pen is recording. Effects of adjustments can be seen *while* they are being made. Since it is not necessary to withdraw the recording chassis to make adjustments, there is no possibility of causing a pen zero shift.

Interchangeable chassis and controllers Recording and indicating chassis are interchangeable. Just pull out one chassis and plug in the other. Quick-connect air terminals eliminate the need for tubing connections. Two- and three-mode controllers with backset adjustments are also completely interchangeable.

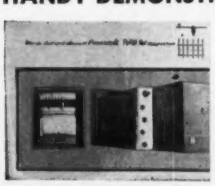
Easy-to-read, easy-to-change 4-inch charts Pen position on the 4-inch chart permits instantaneous reading of variables at all times. Pen arm design also permits rectilinear recording. Front-loading, tilt-out chart drive makes it easy to change chart rolls in a matter of minutes.

All cases fit 6 x 6 cutouts All models fit standard panel cutout of 6″ x 6″. Overall dimensions: 6¾″ wide; 7½″ high; 15¼″ deep.

Calibrated control adjustment Adjustments to controller can be easily made from back of the panel by removing controller cover. Calibrated dials for each adjustment ensure precise setting of proportional band, reset and rate values. Optional front-set control adjustments make it easy to set control from front of panel.

Easy to remove components To remove any particular component from the case, it is only necessary to loosen a screw or lift a latch.

HANDY DEMONSTRATOR-IN-PRINT Get the full story on new Honeywell *PneumatiK Tel-O-Set* Instrumentation by writing for this handy demonstration-in-print. This booklet covers in words and pictures all the important installation, operation and maintenance features of the new line. It will help you evaluate the many advantages *PneumatiK Tel-O-Set* holds for your process. Send for it today. MINNEAPOLIS-HONEYWELL, 4400 Wayne Avenue, Philadelphia 44, Pa. In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.



HONEYWELL INTERNATIONAL Sales and Service offices in principal cities of the world. Manufacturing in United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

can grease the hub about which revolves the entire wheel of refinery and petrochemical operations. Gas oil fed to these units totals about 3 million bbls./day, roughly 50% of the total crude oil fed to refineries. From these units come heating oils, gasoline, and feed for the refinery petrochemical complexes.

While the average value of the products from a cat cracker is about $4.80/bbl., the gas oil feedstock costs about $3.50/bbl.—often less than the price of the crude oil from which it is taken. Generally the amount of high-boiling, heavy gas oil that can be fed to an FCC unit has been limited by metal poisons, concentrations of which increase as the oil gets denser.

As a result, refiners normally separate a light gas oil (for feeding FCC units) from a heavy oil. And the heavy oil is cracked thermally or broken down to coke and light products in delayed, contact and fluid-type cokers.

But by continually removing the metal contaminants from the catalysts, Atlantic has found that these heavier oils can be efficiently processed in an FCC unit. The firm says it has successfully run the complete range of bottoms (reduced crude) left from the atmospheric distillation of sour midcontinent crude oils.

At the same time, the amount of coke deposited on the FCC catalyst has been reduced 30%. This coke deposit, an accepted disadvantage of FCC operation, usually turns out to be the bottleneck in operating designs. It must be burned off the catalyst in the "regenerator"; and regenerator capacity usually sets the limit of the unit. If coke production is reduced 30%, however, total feed and total valuable products can be increased a corresponding 10-20%.

Activity-Selectivity: This reduction of coke formation calls attention to two confusing terms regularly applied to FCC catalysts; activity and selectivity. Activity refers to a catalyst's ability to crack large molecules into small ones, depending on surface area. Example: a catalyst with a high surface area per pound might have a high activity for cracking gas oil into coke and hydrogen; but it wouldn't be very useful to refiners.

On the other hand, a catalyst that can crack gas oil to liquid products, yielding relatively little coke, is said to be highly selective. And this is the kind of catalyst FCC operators want.

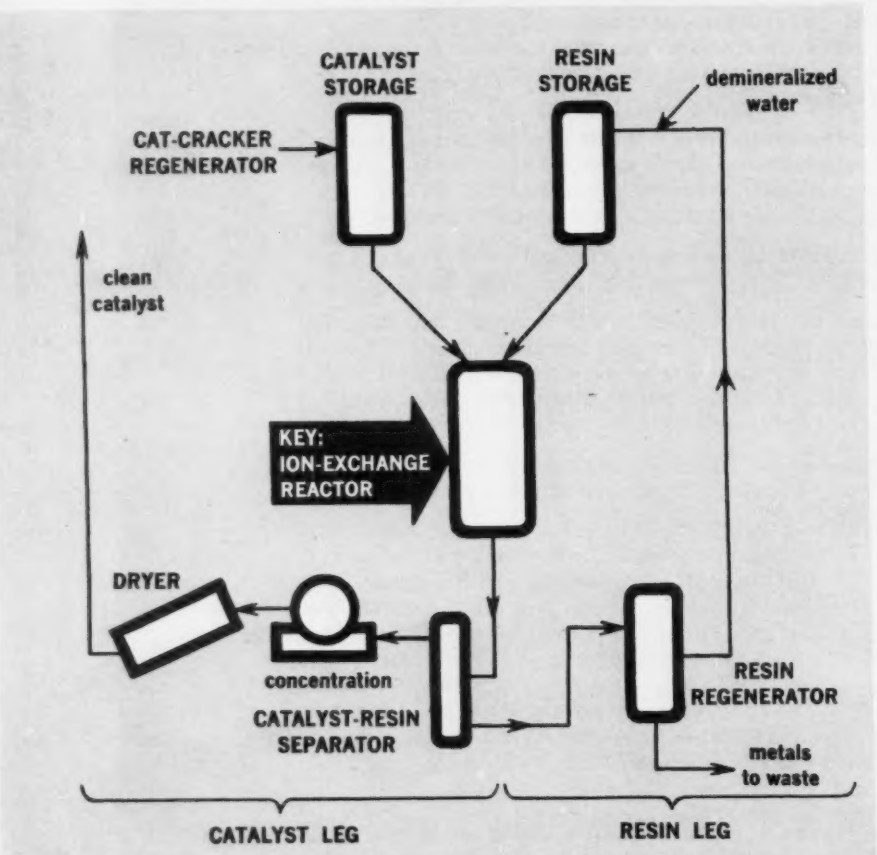
Met-X has no effect on the activity of a catalyst. But Atlantic engineers claim it can return a catalyst's selectivity value to better-than-new. And they say that this is not accomplished by removing all of the metals—only the active poisons.

This concentration on active metal poisons is a new approach for process researchers, who have generally tried to regenerate FCC catalysts by removing all metals—e.g., nickel, vanadium and iron. One patented process, for example, uses a tabling technique that separates the heavier (due to metals) contaminated catalyst by washing a catalyst slurry over ripple tables.

Selectivity is measured by a so-called coke-producing factor (CPF). Atlantic researchers list four sources: (1) catalytic coke (about 45% of total coke), formation of which is inherent in the catalyst; (2) "cat-to-oil coke" (20% of total), which results from oil molecules trapped in the pores of the catalyst; (3) Conradson coke (5% of total), which is inherent in crude oil; (4) contaminant coke (30% of total), which results from metal contaminants. It is this contaminant coke that Met-X has been able to eliminate.

Although Atlantic is still withholding too many details to permit a definitive analysis of Met-X, the obvious enthusiasm of Atlantic executives at the Philadelphia unit's startup strongly suggests that it has been successful. In fact engineers associated with the project say privately that the estimate of a $1-million/year profit bonus is conservative. Undoubtedly, the firm will have to produce additional hard technical facts before it can license the process, and these facts will likely soon be forthcoming. If they verify present claims, Met-X may well become one of the biggest boons to petroleum refiners in several years.

Heart of new Met-X process is ion-exchange reactor.



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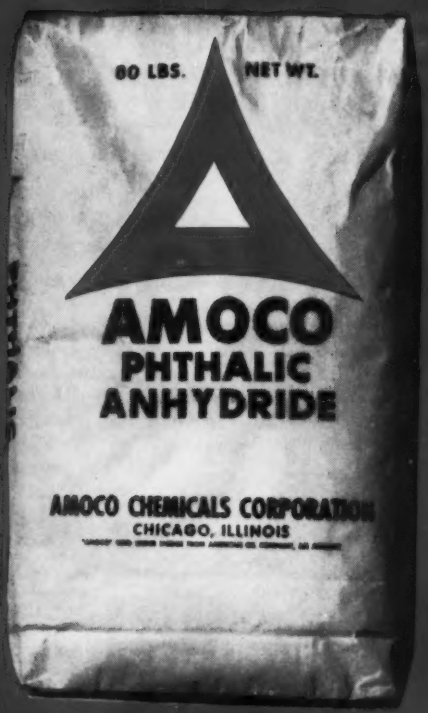

Isophthalic Acid
Phthalic Anhydride
available in color-coded bags

Here's another service from Amoco Chemicals. Now your shipments of AMOCO Isophthalic Acid and Phthalic Anhydride are coming to you in distinctively colored bags —IPA in bright yellow, PAN in snow white. (Of course, all bags continue to be clearly labeled with the product name on front and back as well as on the gussets.)

With this new color coding, your manufacturing and warehousemen can identify AMOCO IPA and PAN immediately—and from a distance—by the distinctive colors of the bags. You save time, eliminate error, simplify warehousing when you buy your aromatic acids from Amoco Chemicals in these new color coded bags. And Amoco Chemicals can ship to you *now*, all of these products you want; when and where you want them. Ask your Amoco Chemicals representative for more information.

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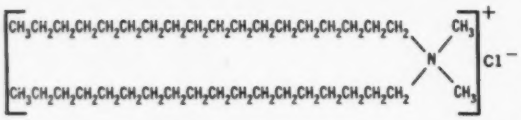
New patterns in chemistry with General Mills FATTY NITROGENS

EXAMPLE: Softening Textiles with Aliquat H226

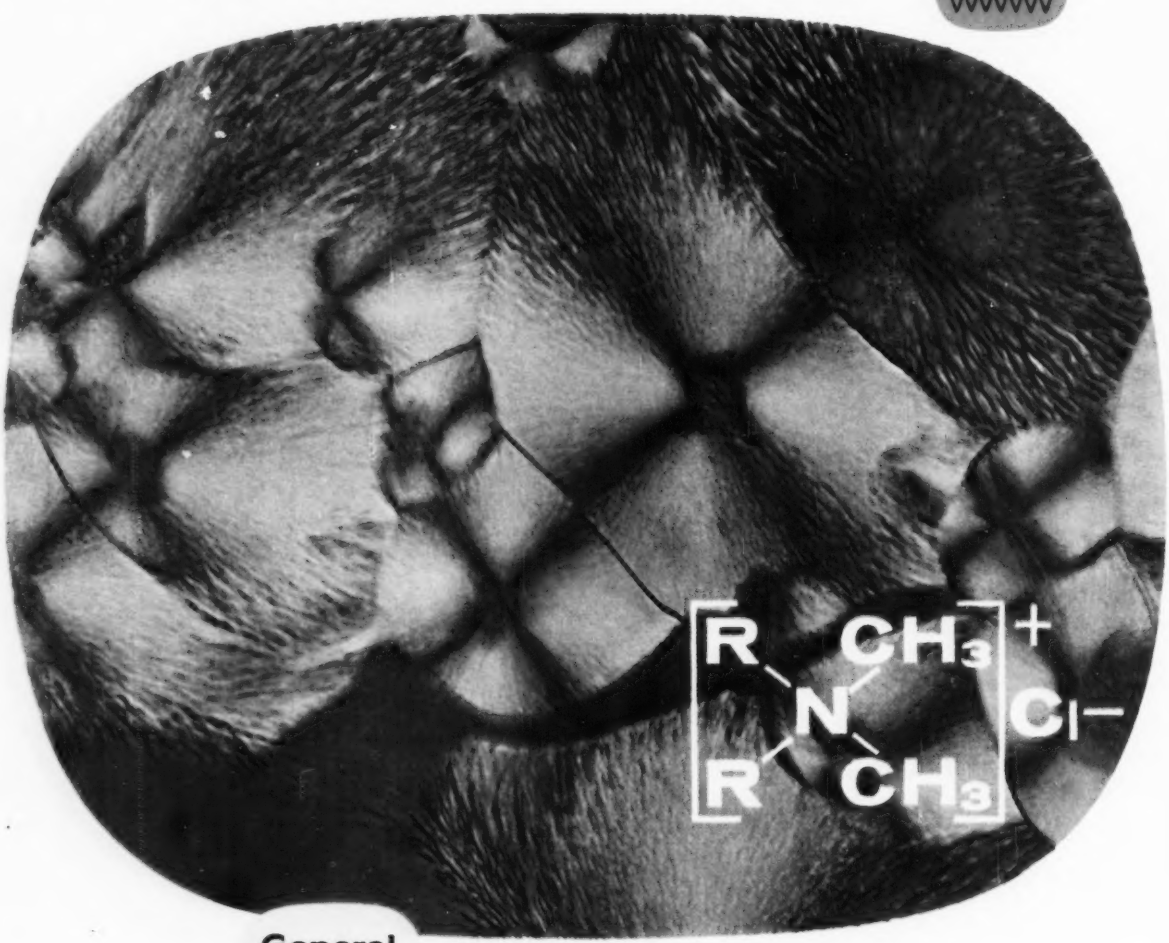


Aliquat H226 combines the softening and lubricating properties of the two fatty C18 chains with strong adsorption (substantivity) on fabric surfaces. The attraction of negatively charged fabric surfaces for the quaternary cation imparts high softening efficiency to the Aliquat; 0.00065 to 0.00125 grams of active quaternary is sufficient to soften one gram of fabric. The C18 chains, in addition to their softening ability, limit the solubility of the quaternary molecule and thus intensify substantivity.

Aliquat H226 favorably affects all the elements contributing to fabric softening—surface touch, flexibility, compressability and elastic recovery. Aliquat-based softeners reduce interfibre friction through the lubricity of the fatty chains and thus increase fabric tear strength. Strength is increased 25% in the direction of warp and up to 69% in the direction of fill.

Fatty Nitrogens contribute many other specific properties to chemical compounds that improve their utilization. Why not investigate . . . write us at Kankakee, Illinois.

The Aliquat H226 crystals below were photographed at 100 x magnification with polarized light.



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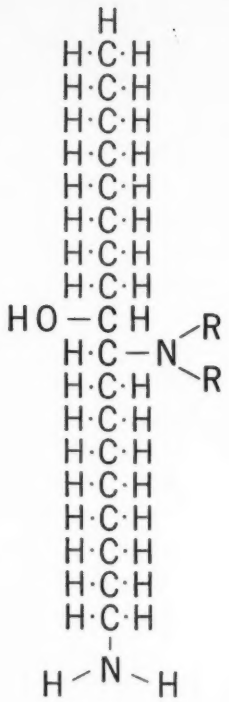


New Carbon Chain Design Opens Broad Vistas As Intermediates

The new structure represented in General Mills Hydroxy Amines promises exciting new possibilities for tying into *three functional groups* on the 18 carbon chain.

In early exploration of the opportunities for building molecules with unique properties, General Mills has prepared 8 of these compounds . . . varying only the non-terminal amine group. Preliminary research indicates useful application as corrosion inhibitors, biocides, chemical intermediates, epoxy co-reactants and petroleum product additives. These Hydroxy Amines have exceptional solubility in polar and non-polar organic solvents.

Research size samples and descriptive data are available for evaluation of these remarkable new fatty nitrogen chemicals. Send requests on your letterhead to: Commercial Development Department, General Mills Chemical Div., Kankakee, Ill.

General Mills CHEMICALS

Platinum Bargain

Thanks to a novel platinum purchase agreement, the process research section of Esso Research and Engineering Co. recently chalked up a $197,000 savings on a pilot-plant project.

The problem: Esso engineers required about 2,400 oz. of platinum to line a key reactor in which temperatures up to 2400 F were used to treat crude oil. Platinum was necessary because a lesser noble metal might have been chewed up by catalytic action, invalidating the data. Solution: the platinum reactor lining was obtained from International Nickel Co. in a buy-back arrangement.

Esso bought the platinum on a credit contract specifying that Inco would buy it back at scrap platinum prices. The reactor vessel was shipped to Inco's Newark, N.J., plant where a 0.02-in.-thick lining was installed. The unit was then shipped back to Esso's Floral Park, N.J., process laboratory, where it was used for the required pilot runs.

After the pilot runs were completed, the reactor was returned to Inco, which removed the lining and paid scrap prices for it. Installed lining cost was $200,000; return from sale of scrap was $197,000. Net cost to Esso for the platinum-lined reactor: $3,000.

Floating Beryllium

A flotation process has successfully recovered beryllium minerals from ores in the Mt. Washington, Nev., district, according to U.S. Bureau of Mines' researchers at Salt Lake City.

The new process, however, will not work on the beryllium ores from the Spors-Topas Mt. district of Utah *(CW, July 1, p. 35)*. The technique will be described in a Bureau of Mines monograph to be published shortly.

Phenacite and bertrandite were the beryllium minerals recovered. And the mineral concentrate varied from two-thirds bertrandite to all phenacite. Recoveries reportedly were high for the batch pilot runs, averaging about 14% beryllium oxide with an 82% recovery. The process is said to be a typical froth flotation, largely alkaline-based, and employing sodium fluoride flotation agents modified with sodium hexametaphosphates.

Ore samples containing 0.49-0.73% beryllium oxide yielded the 14% beryllium oxide product. One unusual sample of ore, analyzing 5% beryllium oxide, gave a concentrate containing 34% beryllium oxide.

The properties in the Mt. Washington area are now being developed by Anaconda, which is reported to have spent more than $500,000 on contracts with Mt. Wheeler Mines Co. (Salt Lake City).

Quartz for Hot Jobs

A method of making quartz suitable for crystals that resonate at temperatures as high as 550 C—vs. the present high of about 250 C — has been devised by Bell Telephone Laboratories.

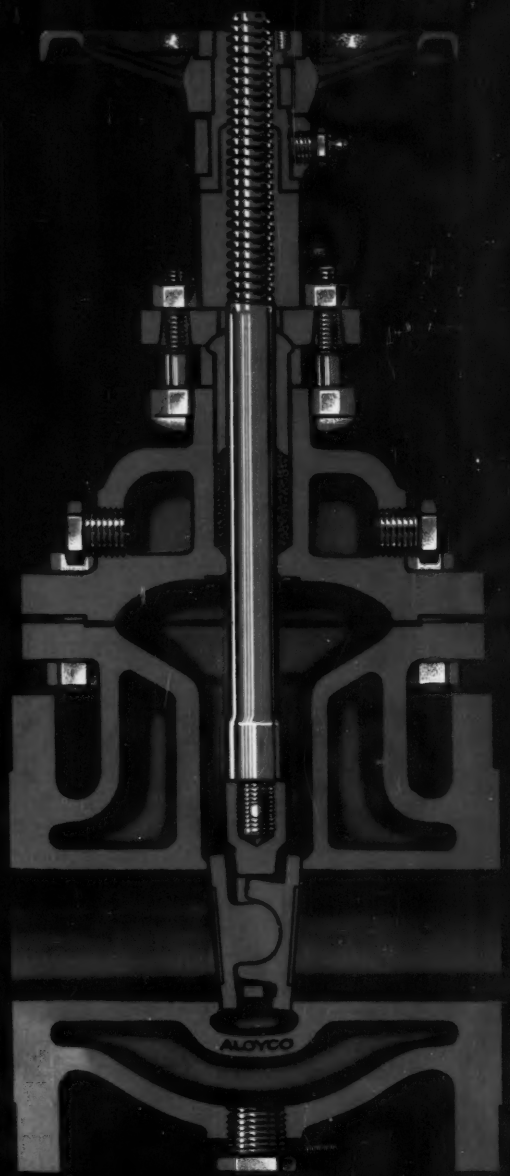
Bell Labs' J. C. King found that electrolytic treatment of the quartz removes the major cause of its energy absorption and high-temperature instability.

An electric field of about 500 v./-cm. is imposed across the quartz crystal for about 24 hours at 500 C. Sodium and lithium impurities are swept out of the crystal by this treatment, and the quartz retains its ability to vibrate with little energy dissipation, even at high temperatures. The electrolysis treatment permits the quartz to be cut at a higher orientation angle than previously thought practical.

The development makes it feasible to operate quartz resonators in the gamma-ray environment of nuclear reactors or in satellites that must pass through the Van Allen radiation belts.

Oil Separator

A flotation column that does double duty as an air-lift to pull in fresh feed is the key to a novel oil-water separator developed for water-pollution control by Pollution Control Engineering, Inc. (Pasadena, Calif.). In a typical, 27-ft.-diameter tank, the flotation column, built into the center of the tank, is a 36-in. pipe. Air diffused into a recycled water stream is pumped into the column above the fresh-feed inlet; dispersed bubbles carry oil to the surface, where it is skimmed off over a notched weir. Oil-free effluent drains out the bottom.



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Market Newsletter

CHEMICAL WEEK
December 9, 1961

Synthetic leather may stomp hard on natural leather markets in about two years, when Du Pont is scheduled to go into commercial production of the former. Du Pont is starting up a pilot-plant at Newburgh, N.Y.—which accounts for a new surge of interest in trade circles.

There's no doubt that the shoe manufacturing industry is eagerly awaiting commercial availability of the synthetic leather, which has been put through extensive practical tests over a long period of time. The armed services are also conducting lengthy tests but their findings are cloaked by military secrecy regulations.

The major mystery about Du Pont's synthetic leather is its chemical composition. Key to this secret is buried in a welter of confusing patents—and Du Pont carefully avoids shedding any light that would clue the industry to nature of the product.

Capacity-burdened maleic anhydride producers, for example, are reportedly clinging to the hope that the synthetic leather involves use of an isocyanate-maleic anhydride product. But this conjecture seems effectively spiked by the insistence of a shoe industry spokesman that Du Pont's synthetic leather is actually a nylon material so modified as to make it "breathe." Some type of heat treatment may be involved in achieving this property. This spokesman adds that the material is "practically indestructible."

Whatever the nature of Du Pont's synthetic leather, it bodes ill for the leather industry and could upset those segments of the chemical process industries that provide leather-processing chemicals.

•

World prices of natural rubber will continue to drop if U.S. and British stockpile sales continue into '62 according to plan (*CW Market Newsletter, Dec. 2*), predicts Sir John Hay, chairman of Kamuning Rubber and Tin Co., Ltd. (Perak, Malaya). He says the much-criticized stockpile sales will aggravate an already troublesome surplus of 50,000-70,000 long tons.

But he finds one "encouraging" aspect in the prospect of declining prices: lower-priced natural rubber may check the expansion of synthetic rubber capacity, and a new supply/demand equilibrium may be established.

But producers of synthetic rubber aren't taking a passive role in the simmering price battle. Last week West Germany's Bunawerke Huels—one of Europe's biggest producers of synthetic rubber (capacity: 120,000 tons/year)—cut synthetic rubber prices 5%.

The most important grade, Buna Huels 150, is now priced at 96¢/lb., and the most important oil-containing rubber, Buna Huels 302, is 76¢/lb. This is the second price cut posted by the firm within a year; the first came last spring after a 5% Deutsche mark devaluation.

•

An official break in U.S. *o*-xylene export prices may take place within the next few weeks. It's likely that Sinclair will be first to bring the reported submarket price into the open—although the company isn't saying so. Such action would confirm recent reports that *o*-xylene is headed for a $93/ton price level *(CW Market Newsletter, Oct. 28).*

Sinclair is one of several U.S. *o*-xylene producers supplying Japanese phthalic anhydride makers; it's no secret the Japanese have been pressuring for a price break.

The expected move by Sinclair could well bring some semblance of order into the U. S. *o*-xylene export market. But skeptics in the trade aren't convinced yet that a "floor" will be established.

•

To handle increasing helium shipments, the U. S. Bureau of Mines will order 25 special helium tank cars, augmenting an existing fleet of 221 railway tank cars that carry 80% of all deliveries (cylinders and customer-owned truck-drawn tank trailers are also used). The new cars will carry 300,000 cu.ft. of helium at pressures up to 3,800 lbs./sq.in.

Collier-Tidewater's petro-naphthalene plans for the West Coast are still very much alive, despite trade talk that the project would be shelved. *CW* learns that the company will go ahead with a good-size plant, although the site has not yet been selected.

First trickle of production has started at Collier-Tidewater's first 100-million-lbs./year naphthalene venture at Delaware City, Del.

There's a new angle this week in the polyethylene split-pricing initiated last week by Eastman Chemical *(CW Market Newsletter, Dec. 2).* Union Carbide Plastics is introducing a new PE compound designed for extruded industrial packaging film, definitely not for retail consumer packaging. The new material—called DFD-0468—is priced at 23½¢/lb.; that's 4¢/lb. less than for PE used in making consumer packaging film.

Clarity and gloss of the new material, says Carbide, "do not approach the optical levels" of the higher-priced PE. But Carbide emphasizes that the material is not considered "substandard PE" in the usual sense—i.e., product intended to be top-grade but inferior because of manufacturing difficulties. Eastman's lower-priced PE is substandard material—and is sold as such.

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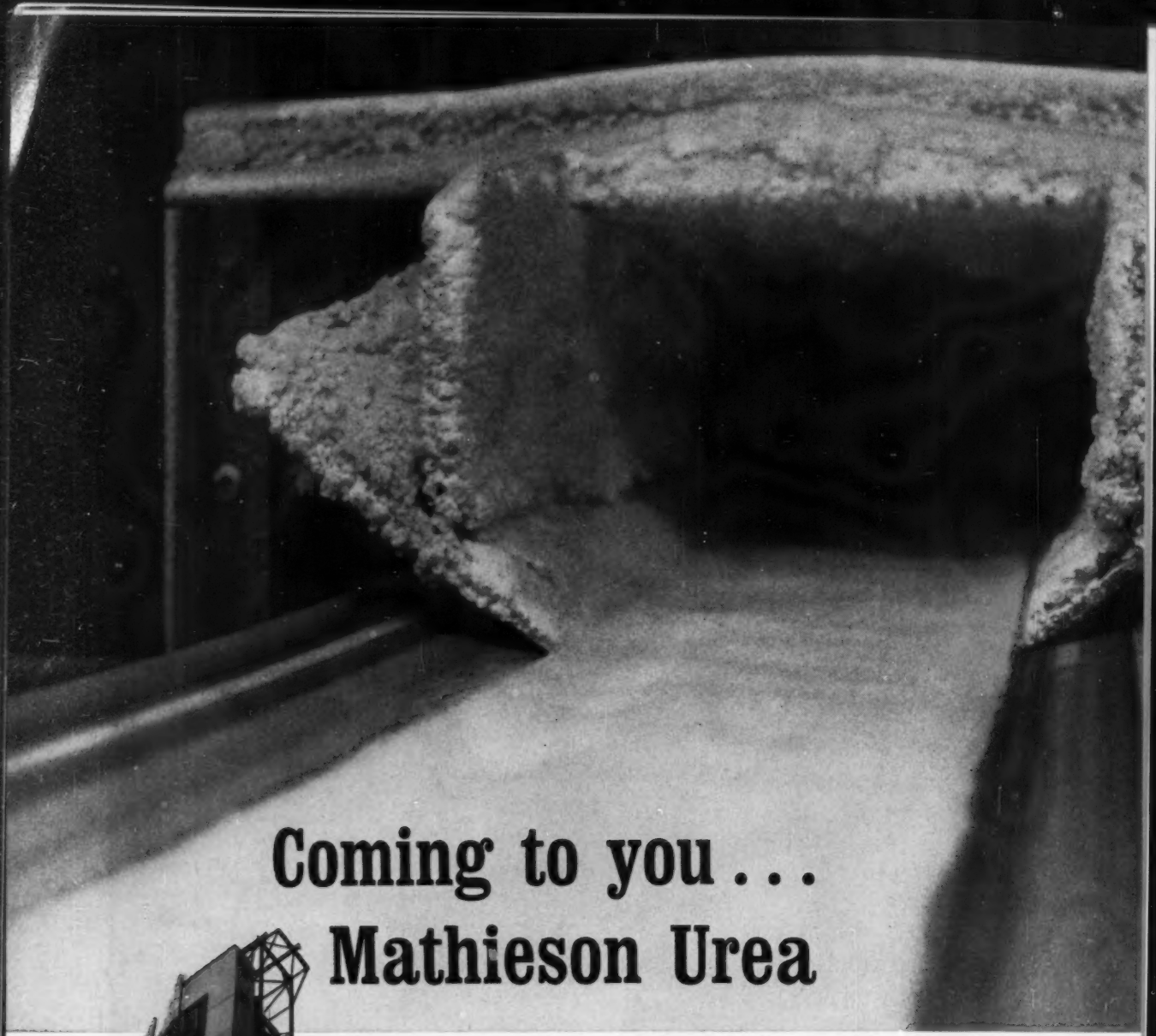

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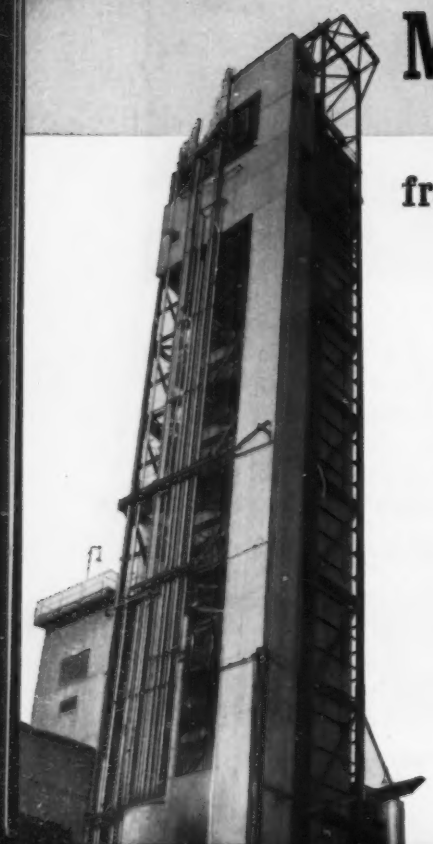

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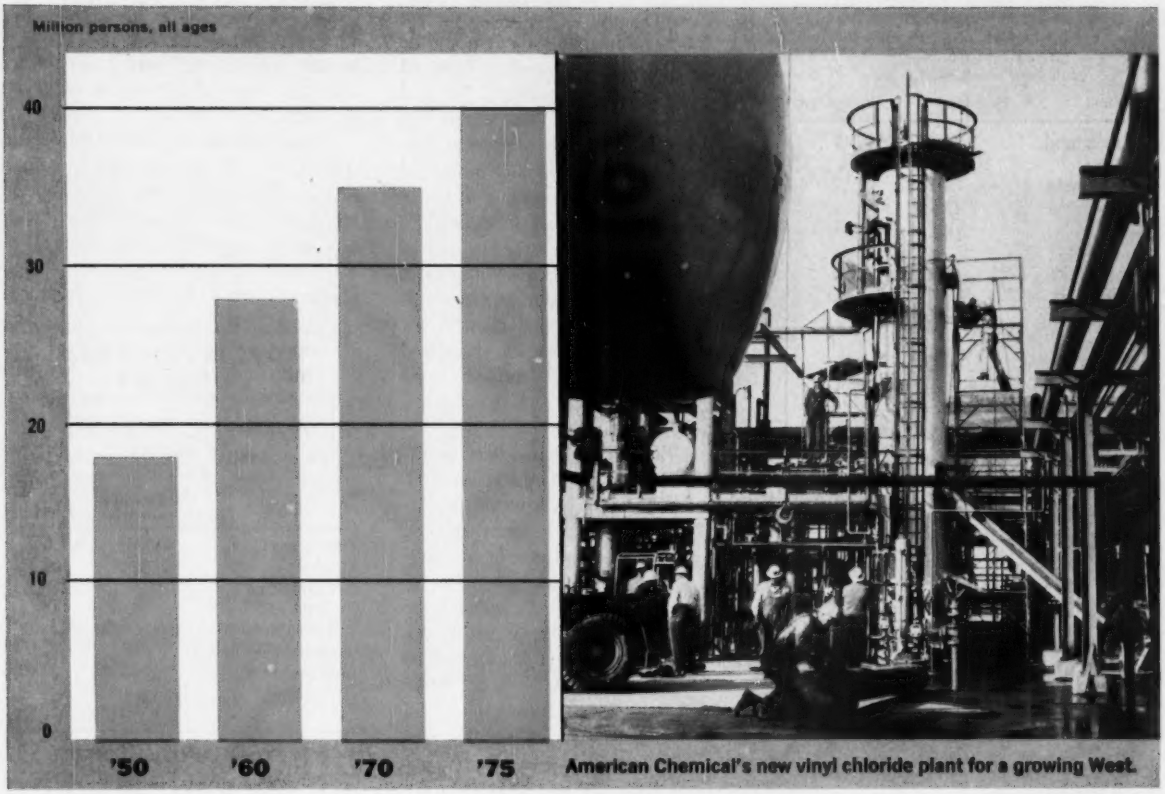
9397

Population boom is key to growth of Western chemical industry



American Chemical's new vinyl chloride plant for a growing West.

People: Key to CPI Growth in West

The chemical industry in the western U.S. was the focal point of attention at last week's meeting of the Chemical Market Research Assn. in San Francisco (CW, Dec. 2, p.26). Consensus of the Western-oriented speakers: the economy of the West is entering a new stage of maturity and growth, and the future will see continued rapid population expansion, new plant construction, mounting chemical production.

Basis of this optimism is the West's continuing population growth (*see chart above*). In '60 the population of the 11 Rocky Mountain and Pacific Coast States regarded as the "West" was about 28 million, compared with 19 million in '50. According to Stanford Research Institute's H. E. Robinson, the West's population will increase to at least 35 million in '70 and to 40 million by '75 — a growth of over 100% in the 25-year period from '50-'75. Meanwhile, population of the entire U.S. is expected to expand only about 45%

Moreover, the Western population will have more spendable income than consumers in the rest of the U.S. In '60 the West had 15.2% of the nation's population and 17.1% of the total spendable income. By '75 it will have 17.7% of the population and 19.3% of spendable income. This affluence spells lucrative markets.

But all the Western states will not share equally in the prosperity. California — the giant of the Western economy — will continue to register the greatest economic gains, outpacing states of the Rocky Mountain and Pacific Northwest areas. Right now California generates 62% of the West's civilian income and houses 58% of its population.

North vs. South: The Northern and Southern sectors of California differ so radically in natural resources, terrain and transportation access that they require separate consideration. Northern California — especially the San Francisco Bay Area — for decades was characterized as a "colonial" economy. Most of its chemical requirements were imported, while its raw materials — food, timber, minerals, etc. — were exported.

But in the '40s chemical manufacturing became important, and today, instead of importing chemicals, the trend is toward "import substitution," as Dow's Western Division general manager, Leland A. Doan, calls it. Chemicals are now manufactured in California—rather than imported—to satisfy local needs.

Northern California's chemical requirements are large and growing. A large part of this area's chemical demand is for food processing, timber production and mining operations. In

ROCKY MOUNTAIN* MARKET
Inorganics

(thousand tons/year, '60)

Chemical	Demand	Production
Sulfuric acid	1,359	1,359
Calcium hydroxide	266	adequate
Sulfur	228	123
Gypsum	186	adequate
Phosphoric acid (P_2O_5)	158	155
Anhydrous ammonia	141	123
Ammonium nitrate	111	81
Nitric acid (100%)	78	84
Sodium hydroxide (100%)	79	not known
Ammonium sulfate	57	24
Sodium carbonate	46	520
Sodium chloride	44	209
Chlorine	37	not known
Sodium sulfate	27	0
Sodium chlorate	21	exceeds consumption
Elemental phosphorus	18	195
Hydrochloric acid (100% HCl)	14	exceeds consumption
Calcium nitrate	11	not known
Ammonium perchlorate	9	12
Ammonium chloride	6	6
Potash (as K_2O)	6	2,071
Other	23	not known

Organics

(thousand tons/year, '60)

Chemical	Demand	Production
Urea	29	0
Benzene	17	32
Tetraethyl lead	14	0
Acetylene	9	9
Other hydrocarbons	8	8
Toluene	4	7
Alcohols	3	0
Xylenes	2	4
Pine oil	1	0
Cresylic acid	1	0
Xynthates	1	0
Glycerin	0.9	0
Glycols	0.8	0
Amines	0.8	0
Miscellaneous flotation agents	7.4	0

*Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico. Source: Western Phosphates Inc.

'60 northern California produced more than 6 billion board ft. of timber. In addition, since the early '50s, the plywood industry has been moving into the region, and the paper industry is building up rapidly. Both of these industries are lusty chemical and resin consumers. The trend has brought plywood resin producers into the area as well as basic industrial chemical plants to supply the area's pulp and paper processing needs.

The growing population in northern California has helped stimulate an enormous and expanding agricultural industry. This area accounts for about 6% of the nation's annual fertilizer demand (1.5 million tons) and about 8% of the U.S. total pesticide requirements.

Population growth also has boosted paint, soap and detergents demand. Result: northern California represents about 4% of the U.S. paint market, 2.9% of the soap and detergents market (*see table*). This has given rise to construction of plants for production of phthalic anhydride, styrene-butadiene latexes, polyvinyl acetate, and a variety of other resins and resin raw materials. Petrochemicals—based on output of refineries in the Bay Area—are being produced at a faster clip to supply the raw materials for many of these products.

Southern Isolation: Southern California—economic center of this sector is the Los Angeles metropolitan area—is plagued by a problem shared by other areas in the West: it is relatively isolated from the rest of the country. Hugo Reimer, president of U.S. Borax & Chemical Corp., says:

"Except for its relative proximity to the San Francisco area, the southern California market is . . . a community separate . . . from the rest of the country. Although air transportation has reduced the travel time to other centers, the high cost of the movement of goods from and to Eastern markets continues to pose major economic problems."

This isolation, Reimer adds, has had an influence on the development of the chemical industry in southern California. It has induced Eastern producers in many cases to locate branch plants and warehouses in southern California to avoid high transportation costs, and it has made commodity shipments from the area highly selective.

As a result chemical plants have been built in the area to produce chemicals locally for growing local needs. To date, plants have been built that are small enough to serve a limited market, yet permit economies over the cost of importing of those products.

There are southern California industries — soaps, detergents, paints, surface coatings — that grow directly with population increases. But there are others that have not kept pace with local population growth — e.g., plastic. Southern California produces

HOW MUCH THEY CONSUME

Northern California and Hawaii

	'60 Tonnage (thousands)	Percent of U.S. Tonnage
Fertilizers	1,532	6.1
Alkalis	245	3.6
Caustic soda		
Soda ash		
Sodium silicate		
Phosphates (P_2O_5)	70	2.7
Sulfuric acid	460	2.6

Source: Dow Chemical Co.

Northern California

Products	Percent of U.S. Consumption in '60
Pesticides	8.0
Paints and allied products	4.0
Inorganic chemicals	3.9
Miscellaneous chemicals	3.3
Soap and related products	2.9
Vegetable and animal oils	1.3
Drugs and medicinals	.7
Organic chemicals	.5

Source: Dow Chemical Co.

Southern California

Products	Percent of U.S. Consumption in '58
Industrial inorganic and organic chemicals	3.0
Plastic materials, synthetic resins, man-made fibers	3.2
Drugs	1.8
Soaps, detergents, toilet preparations	5.4
Paints and allied products	6.4
Gum and wood chemicals	0.1
Agricultural chemicals	3.2
Miscellaneous chemical products	3.2

Source: United States Borax & Chemical Corp.

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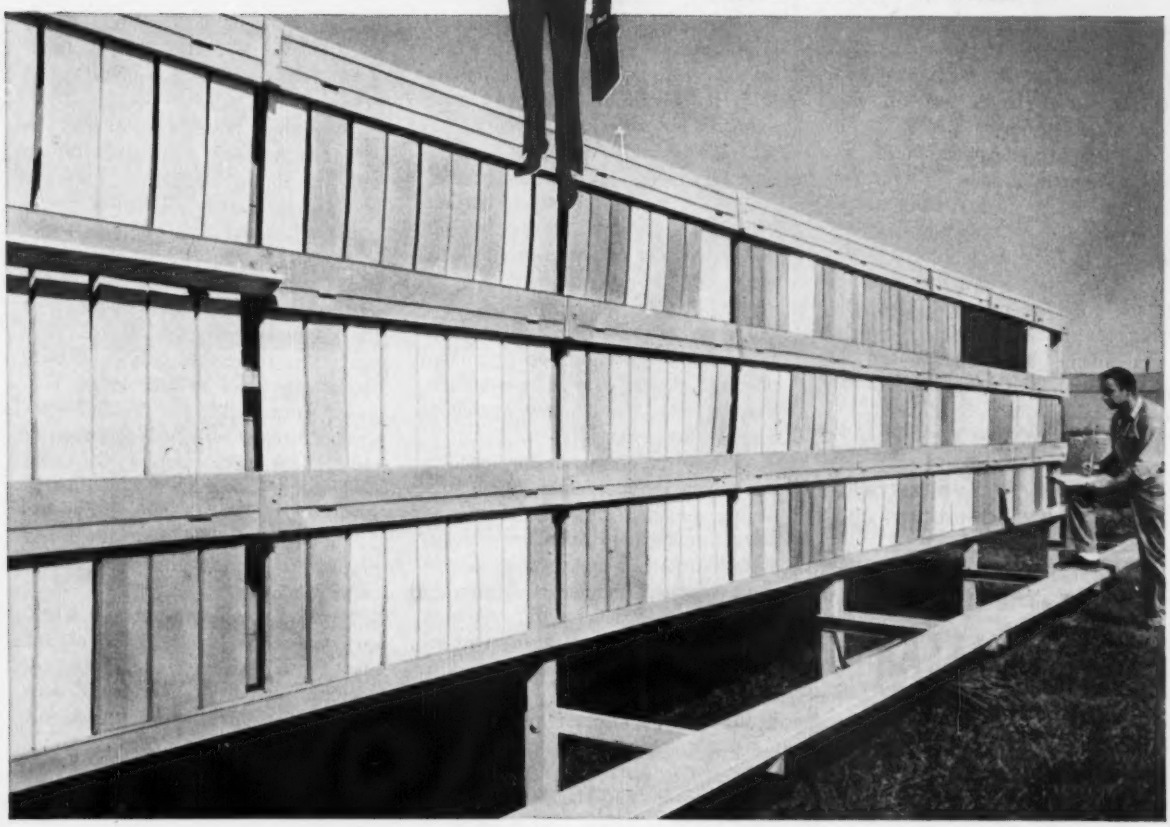

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This changing pattern in helium technology plus articles on what happens to vinegar plants when the air supply fails, how hospitals use polyethylene to fight staph infections, fire hazards in plants, and titanium heat exchangers appear in the December issue of U. S. I. Chemical News See the December 16th issue of CW. Or get the expanded Chem News by mail each month. Write U. S. I., Room 904, 99 Park Avenue, New York 16, N. Y.

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about 4.8% of the nation's resin supply, consumes at least 6.5% of the U.S. resin output.

At present, southern California has no synthetic or cellulosic textile industry. But the area's huge demand for these materials indicates that some day the area will boast of a fiber industry.

Rocky Mountain Area: Unlike California, the Rocky Mountain area is still in its adolescence as a producing and consuming economy. With the exception of sulfuric acid, industrial chemical consumption in the eight Rocky Mountain states is light (*see table*) but is getting heavier.

About 90% of the chemicals used in this vast geographical area go into the production of fertilizer, uranium oxide or the processing of ores to metals. The remaining 10% is used in the manufacture of pulp and paper explosives, propellants or petroleum refining, steam power production, food processing and many miscellaneous applications.

Most of the chemicals consumed in this region are inorganics. Plants producing plastics, synthetic fibers and petrochemicals are virtually nonexistent. It does not appear that the organic chemical industry will develop rapidly or that rich natural resources will be fully exploited during the immediate future. The area's lack of a fast population growth — a concomitantly larger consumer market — is the major impediment.

Also, the distances between mineral deposits and large population centers are significant drawbacks to rapid industrial development in the Rocky Mountain region. Exception: when alternates of the area's raw materials are not economically available elsewhere. For example, phosphate and potash production in the Rocky Mountain states should continue to grow rapidly.

But mineral mining (other than potash and phosphate) in the Rocky Mountain area is uncertain. The factors clouding the outlook include national political decisions concerning uranium contracts as well as worldwide market conditions and changes in mining and processing technology. In '60 mining and processing — excluding uranium — took about 648,000 tons of inorganic chemicals and 19,500 tons of the organics. The organic chemical total is made up almost entirely of flotation reagents; sulfuric acid and calcium hydroxide make up the lion's share of the inorganic chemical demand.

Uranium processing is now big business. According to Western Phosphate Inc.'s Elwood Lentz, the 23 mills operating in the area last year consumed about 546,000 tons of inorganic chemicals. And their chemical requirements should continue strong until at least '66, when Atomic Energy Commission contracts come up for review.

Northwest Needs People: The Pacific Northwest is stirring, according to Fred Shanaman, former president of Pennsalt Chemical Corp. of Washington (Tacoma). But, as in the Rocky Mountain states, population growth is needed to greatly expand its chemical industry. Although population in the Northwest will grow about 2.2%/-year, this represents only a slightly faster rate than in the entire U.S. Based on this index, the Pacific Northwest's chemical activity should register only slight gains during the next decade. Right now the Northwest represents only about 3% of the nation's chemical industry, with forest products the most important chemical customer.

Plywood production created a major market for synthetic resins for plywood adhesives. Wood pulp production—another lusty chemical consumer—is continuing strong in this part of the country.

The pulp industry promises to continue to remain an important source of by-product chemicals obtained from pulp cooking processes.

Also the oil fields of western Canada have been successfully developed. Eight refineries are currently in existence that use this Canadian crude and three more are in the planning stage. These developments could be the start of vast petrochemcial complexes.

In sum, California will lead the Western states in chemical industry development for at least the next 10 years. Meanwhile, the Pacific Northwest and Rocky Mountain areas will grow but at a much slower pace. The destiny of these two enormous land regions is largely dependent upon the development of large populations and thus big consuming centers. Right now these regions are not experiencing a massive population invasion.

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Chemical Newsfront

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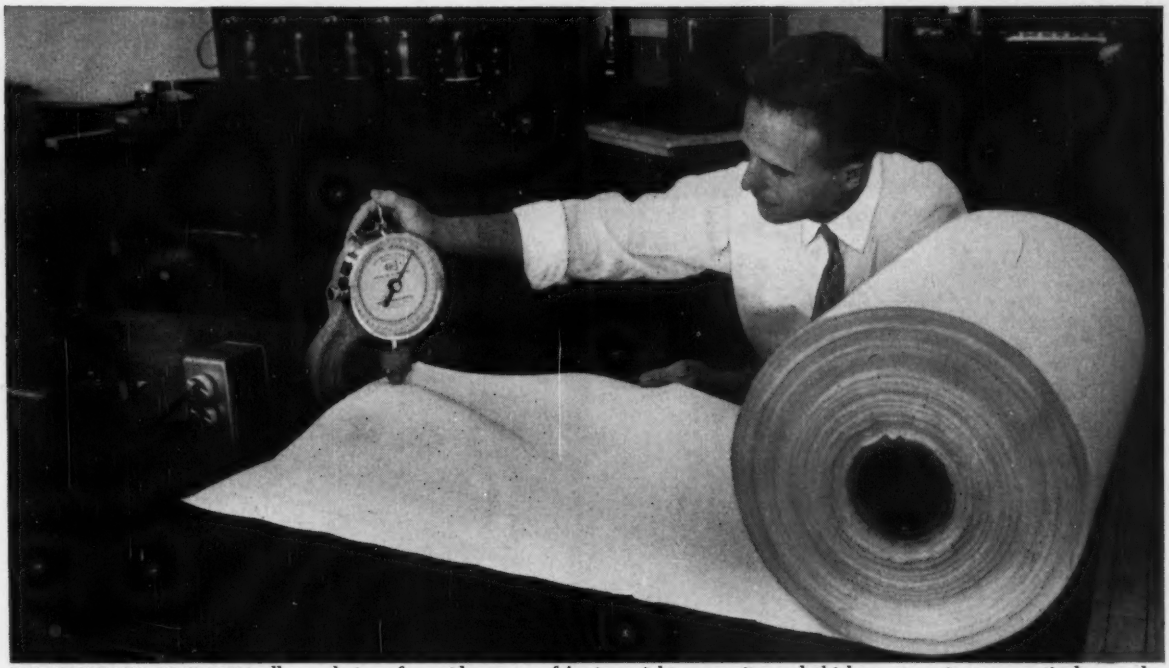

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Saponification Value	209—211	198—203
Acid Value	208—210	197—202
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Visitors to the Chemshow saw less flash and dash, more of broader, solid equipment lines.

Chemshow Catches Industry Image

Last week an estimated 35,000 visitors worked their way through the more than 535 exhibits at the 28th Exposition of Chemical Industries in New York City's Coliseum. The effort was tiring and at times almost overwhelming for those attempting to probe beyond their own specialized needs for information. But the reward was a first-hand look at equipment and materials suppliers who most closely reflect the chemical industry's state of health.

The tone of chemical industry business and spending—which is on the upswing—was indicated by the tenor of the Chemshow—strong optimism displayed in subdued tones. Gone was the flash and dash of hucksterism, exhibits that leaned heavily on one or two attention-getting devices. Instead, most companies attempted to project the image of solid technical competence in a broad range of products.

Responsible in part for this mood is the recession period, which forced some of the less-sound equipment makers to the wall. Unprofitable lines were dropped and many of the more prosperous firms absorbed the hard-pressed. And, even with the business upturn, some the larger firms have sought to consolidate their positions through mergers.

For example, in the field of centrifugal separators, Sharples Corp. broadened its equipment line by obtaining Fletcher as a division. Just a week before the Chemshow, DeLaval Separator Co. acquired Hercules Filter to expand its line in separation and filtration. And the Pall Corp. branched out from filtration equipment into gas-drying and temperature measurement by obtaining Trinity Equipment Corp. as a subsidiary.

The Big Picture: Missing from the show was the exploitation of fads seen in previous years. For example, computer control of processes, so much in evidence at the last two Chemshows, was placed in perspective. Firms such as Minneapolis-Honeywell and Taylor Instruments included computer displays only as a part of broad process instrument lines.

And while the international flavor was not strong, there was increasing evidence of awareness of foreign equipment. A number of equipment makers displayed foreign equipment that they offer. Pfaudler Permutit listed locations of its overseas plants, displayed a new Krupp filtering centrifuge from Germany, which it has added to its line of equipment in this country. A number of Canadian equipment makers joined forces for a large display under the banner of the Canadian government. And, The Ozone Processes Division of The Welsbach Corp. displayed examples of French chemical processing involving the use of ozone by Polyplastic of Paris to modify polyethylene pipe with inexpensive carbon filler (*see Technology Newsletter*).

Standards for Pumps: The show put a glaring spotlight on the delicate subject of pump standards. Goulds Pump, Dean Bros., Duriron and

others displayed their version of the "standard pump." Goulds, for instance, displayed 17 pumps with standardized external dimensions (e.g., all are 23 in. long, employ ½-in. bolts to hold the pump to the base). Allis-Chalmers displayed a similar pump but has carefully refrained from committing itself to any dimensions. Some of the other pump manufacturers, which have been setting up their own "standardized pumps" and promoting interchangeability of parts for some time, were openly resentful.

In truth, the whole subject is so charged right now that it's all but impossible to hold a rational discussion on the subject. What does seem clear, however, is that proponents of pump standards have reason to display some cautious optimism.

The American Standards Assn.'s sectional committee on standardization of pumps for chemicals (B-73) is due to meet before the year is out. At least some members express confidence that the outcome will be an agreement. But such an agreement has seemed imminent in the past, too.

As always, the Chemshow was the vehicle chosen by a number of manufacturers to show off new and improved equipment items. It just isn't possible to do justice to all of them. However, three of the standouts were in solids blending, chlorine cooling and a combination filter-centrifuge.

Continuous Solids Blending: Patterson-Kelley Co. (East Stroudsburg, Pa.) nailed down a great deal of interest with two new continuous solids blenders—one for solids-solids systems, the other for liquid-solids. The blenders are designed for use individually or in tandem.

The solids-solids blender is an inclined, rotating, zig-zag tubing. The principle employed is simplicity itself; it's essentially a combination of several P-K V-shaped twin-shell batch blenders. The solids to be blended are dropped automatically into the first leg, or V, and overflow into the second. Some of the material from the second overflows back to the first. The net result of this two-way flow is continuous, random recycling. And the material is discharged from the last V in spurts (metered slugs) at the end of a complete revolution. Flow rate for a given machine (and therefore the residence time for blending) is a function of the speed at which it is rotated and the angle at which it is inclined.

Patterson-Kelley says the unit opens up some new doors to continuous solids blending. The big feature is the uniformity of the product. Says John Fischer, chief engineer concerned with process equipment: "It means it's now possible to use continuous blending and obtain variations less than plus or minus 4-5%. Actually, on many products we're learning we can obtain variations of less than 1-2%." An important bonus could be that the size of the slug that's discharged can be metered to close limits—normally the maximum variation from slug to slug is less than 1%. By tying the blender into a packaging line, it would be possible to eliminate weighing.

The liquids-solids blender is aimed at introducing liquid into a mass of solid particles when the proportion of liquids is small. Like its solids-solids counterpart, the new device is a continuous version of older Patterson-Kelley batch machines, in this case the liquid-solids blender and solids processor. It's different in configuration from the batch types but the same principle is put to work. Essentially, the liquid is broken up into subdroplets, or fog, by centrifugal action and thrown out radially in a wide band—without touching the wall of the chamber. Solids are subject to a combination of centrifugal force and air suspension.

The new device is said to provide a precision and control not formerly available. However, metering accuracy is essential and capacity range is limited to approximately 10-300 cu.ft./-hour. For smaller outputs, P-K suggests a batch blender; for bigger ones, several parallel continuous machines.

Chlorine Drying Package: The Pfaudler Co., a division of Pfaudler Permutit Inc. (Rochester, N. Y.), introduced a packaged chlorine drying system that could have major impact on future chlorine plant construction.

The packaged system includes titanium coolers, which in the last six months have been installed or specified for 18 cooling units at chlorine plants. It will also substitute glassed-steel drying towers for brick-lined towers that are now standard in chlorine plants. Total selling price, including complete engineering services and startup supervision, will be less than $100,000 for a 100-tons/day system. This will make it competitive with other systems, particularly for firms with small engineering staffs, according to Larry Rodgers, Pfaudler's product manager of special metals.

Just how well glassed-steel drying towers will fare in competition with brick linings (which Pfaudler says are susceptible to leakage through mortared joints and membranes) remains to be seen. But there is no question about the acceptance of titanium coolers. Stauffer Chemical pioneered titanium cooler development at its Niagara Falls, N. Y., plant. The first unit has now been in operation for over two years and a second unit is being installed. Dow Chemical, as well as other major chlorine producers, is also in the process of installing titanium coolers.

Titanium Metals Corp. of America, which sponsored an economic study of chlorine cooling by R. B. MacMullin Associates (Niagara Falls, N. Y.), says that use of titanium coolers for wet chlorine gas can yield an after-tax return on investment of 23-30%. Payout time is two-three years.

And, titanium coolers require about one-eighth the space of conventionally used glass coolers because of better heat-transfer rates. This can increase the amount of plant area useable for expansion and other process units. Because the units have long-tested resistance to wet-chlorine corrosion and require little maintenance, they can be installed in areas that are relatively inaccessible—a point that Pfaudler uses to advantage in its packaged design (e.g., a 100-tons/day system including drying towers and utilities requires 20 x 12 ft. of floor space, is 18 ft. high).

Drying Procedures: In most chlorine plants, wet chlorine gas from the electrolytic cells is cooled either by direct contact with water in a tower packed with ceramic grids or by indirect contact with water in glass coolers (or heat exchangers). In both methods, the cooled gas is then dried with sulfuric acid in packed towers. But in the case of direct-contact cooling, the water used for cooling must be stripped of residual chlorine with steam.

On an installed-cost basis, direct-contact cooling can be less than 50% of the cost of indirect-contact cooling with glass coolers. However, operating costs for direct-contact cooling are over three times higher. And, in plants

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where cooling water must be recycled through water cooling towers for reuse rather than dumped directly to the sewer, the load on the recycle system is great.

Glass coolers have been used in a number of plants to overcome the problems of steam stripping, but benefits are marginal because of high capital investment and maintenance cost, according to MacMullin. The use of titanium coolers cuts investment costs by about 30% and operating costs by more than 20%.

Centrifugal Leaf Filters: DeLaval Separator Co. (Poughkeepsie, N. Y.) imported a novel piece of filtration equipment from Switzerland just in time for display at the Chemshow. The unit, which uses centrifugal force to remove filter cake from its leaves, is made by Chemap AG. für Chemie-Apparatebau and will be offered by DeLaval through a licensing agreement.

Called the Funda filter, it was developed by Hans Muller (who also developed a film type of evaporator). It is already in wide use in Europe for dyestuff and pharmaceutical production. The unit is available in a precoat model for operations where the filter cake is not to be recovered and in a dry-residue model where filter-cake recovery is required.

In both units, the filter leaves are suspended horizontally in a closed tank. Automatic controls permit the entire operation of precoating (if required), filtering, washing and discharging of the cake to be performed without opening the filter tank. In the dry-residue model, the filtration cycle also includes cake drying by blowing with air.

Up to the time of cake discharge, the filter operates in the same manner as a conventional pressure-leaf filter. Then the leaves are spun at speeds up to 600 rpm. to fling the filter cake off to the tank walls. In the precoat model, residue is washed off the walls; in the dry-residue model, the residue is blown off into a discharge chamber.

The potential labor and time savings in filter-press cleaning would vary widely, depending on the application. But the opportunities for cost savings are readily apparent with the Funda filter and with the other equipment highlighted at the show—a major reason for the continuing popularity of the Chemshow.

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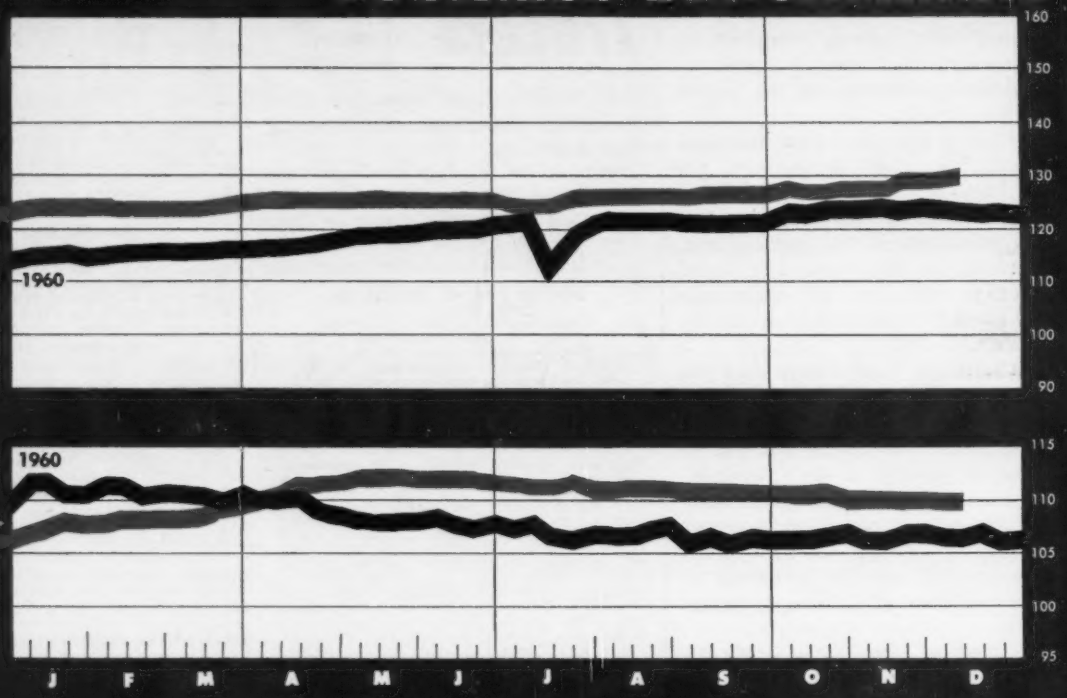

DECEMBER 9, 1961

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	128.3	127.5	124.8
Chemical Week wholesale price index (1947=100)	109.2	109.2	106.8
Stock price index (12 firms, Standard & Poor's)	54.95	55.80	45.76
Steel ingot output (thousand tons)	2,032	2,037	1,367
Electric power (million kilowatt-hours)	15,330	15,678	13,884
Crude oil and condensate (daily av., thousand bbls.)	7,210	7,206	6,992

EMPLOYMENT INDICATORS (Thousands)	Latest Month	Preceding Month	Year Ago
All manufacturing	16,326	16,175	16,505
Nondurable goods	7,046	7,024	7,102
Chemicals and allied products	886.0	888.7	879.8
Paper and allied products	559.2	557.6	567.7
Rubber products	251.9	248.0	258.4
Petroleum and coal products	218.6	220.9	226.2

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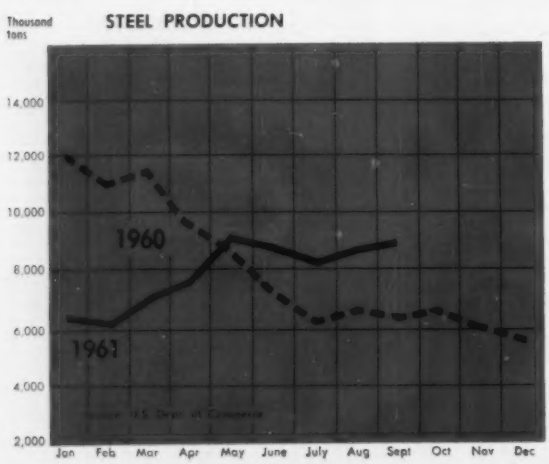

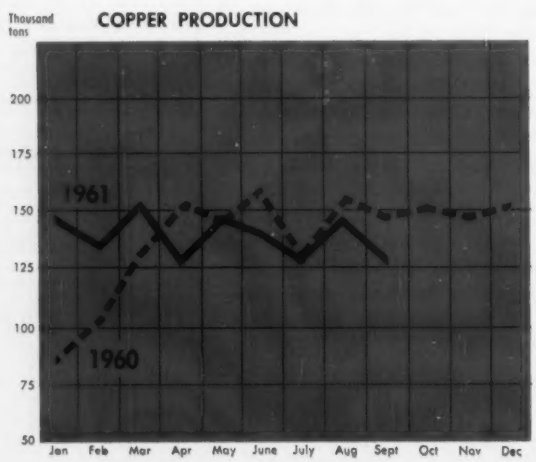

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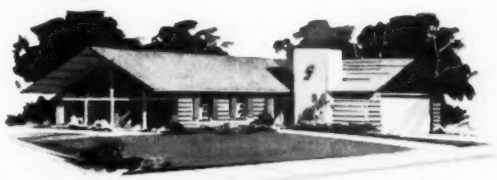

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